DEMCON | macawi respiratory systems

MACAWI Respiratory Blower Specifications

High performance blower for respiratory applications

The MACAWI radial turbine blower for Respiratory applications is specially designed for high pressure efficiency combined with high flow capability which makes it the best choice for ventilation.

For optimal responsiveness, very low rotary inertia is essential. This has been an important requirement for the choice of the motor and the construction of the impeller of the turbine. Special driving software has been developed, that guarantees lowest power consumption during all ventilation scenarios.

Consequently, very high respiratory rates are possible and very good responsiveness to respiratory efforts. The mechanical design has been optimized for simple integration into a housing regarding noise reduction and mechanical vibration absorption.

Where most blowers are constructed with a tangential outlet MACAWI technology is based on the flow-through construction with a patented helicoidally shaped outlet which enables the circular construction of the housing.

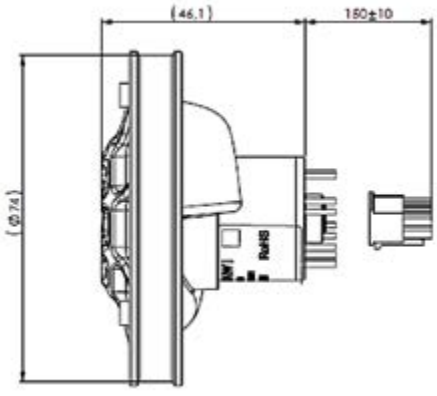
Blower perfromance

BLOWER PROPERTIES Property	Value
U_N	24 V_{DC}
$P_{el.}$ at 2 kPa at 0 flow	~4 W [1]
$P_{el.}$ at 6 kPa at 0 flow	~17 W [1]
Max. Pressure at 0 flow	>10 kPa [2]
Max. output flow	>300L/min. [1]
Max. speed	100.000 RPM
Maximum pressure response	>5 kPa / 100 msec. [1] (dependent of resp. circuit compliance)
Operating temperature	-20 - + 60 °C
Relative air humidity	5 - 95% R.H.
Expected Life time at moderate ventilation loads	> 30.000 hrs.
Gas media compliancy	Blower design for use in Oxygen enriched environment
Dimensions	Ø 75 mm x 55 mm
Blower mass excl. electronics	< 150 gr.

[1] at 101 kPa environmental pressure

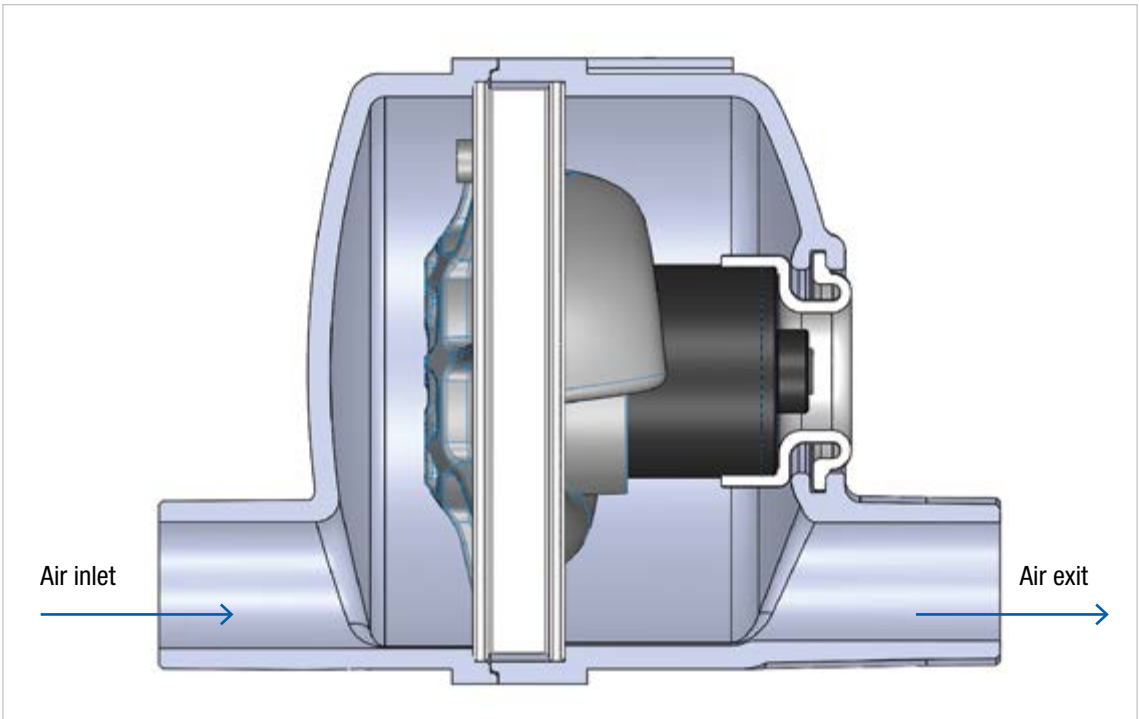
[2] not continuously, depends on thermal management

Mechnical data



Dimensions in mm.

Grommet = Silicon ring as seal, mechanical vibration damper and mounting aid between air inlet and air exit.



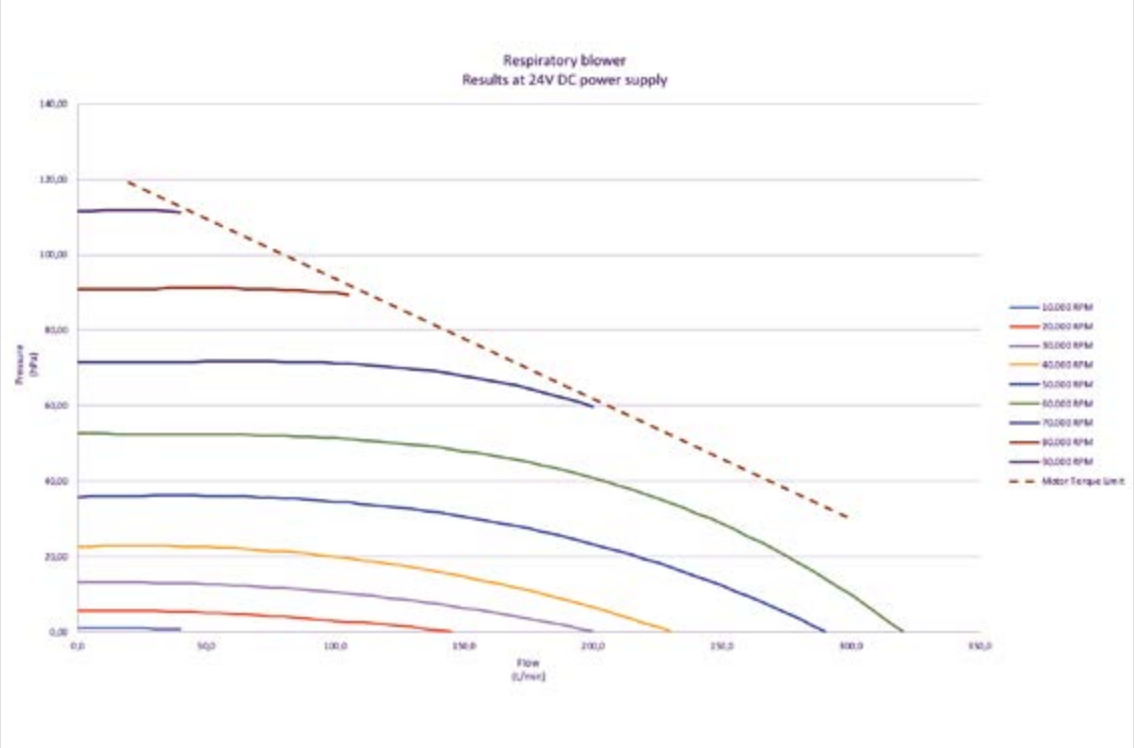


Figure 1 Pressure flow curves

Note:

The shown data is only applicable for dynamic use of the blower. The design is not meant for static high pressure high flow situations because of the maximum motor power of the BLDC Motor.

Motor controller

ELECTRICAL OPERATING CONDITIONS		
Property	Value	Remark
Power Supply Voltage	24V DC ±10%	
Peak current	up to 6A	at 24V max. during 200 ms at maximum insp. pressure setting
Continuous current	up to 2.5 A	at 24V during inspiration at maximum inspiratory pressure setting
Nominal power consumption	5 - 30 VA	at 24V depending on ventilation settings and patient

ENVIRONMENTAL OPERATING CONDITIONS		
Property	Value	Remark
Temperature	-20 - + 60 degrees C	-
Relative air humidity	5 - 95% R.H.	-

DIGITAL INTERFACE		
Property	Value	Remark
Serial interface	UART compatible	3.3V
Commands	• Speed control mode • Get speed and status info • Set baud rate • Firmware update	Speed control Digital or Analog - - -
Digital speed control	0 – ~100.000 RPM	-
Analog speed control	0 – 5V DC = 0 -~100.000 RPM	Standard active from start up
Digital output tacho signal	1 pulse per rotation	open collector
Digital input motor disable	3.3 V	-

DIMENSIONS		
Property	Value	Remark
Controller	86mm x 50mm x 21mm	~credit card 2 boards as piggyback connected

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