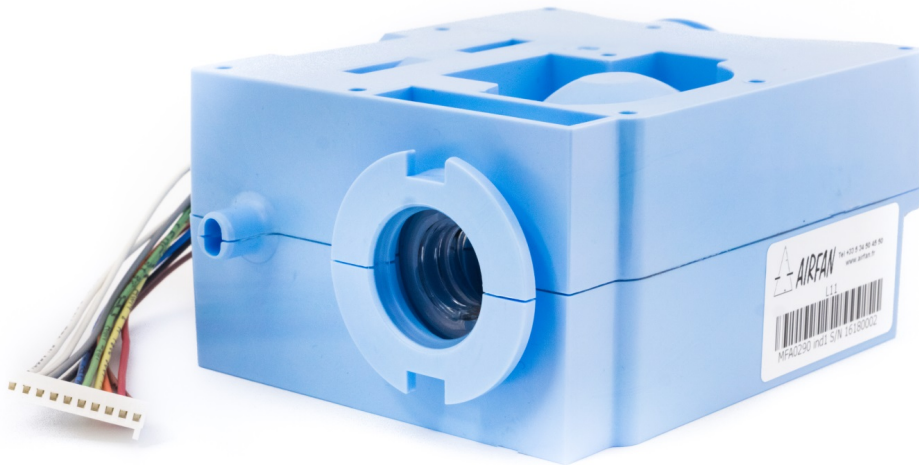


***Scope:***

*The aim of this document is to provide the Technical Specifications of the MFA0290 Blower*



## Summary

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## **1 PURPOSE & DESCRIPTION**

This document specifies technical performances of a MFA0290 Blower.

The blower is mounted inside a ventilator. The blower can deliver ambient air to a patient at set pressure and flow.

Blower type name: AIRFAN MFA0290.

## **2 TECHNICAL STATUS**

### **2.1 Mechanical status**

The blower dimensions are specified in Airfan drawing MFA 0290B-0001-ind 1 (male outlet), MFA 0290C-0001-ind 1 (female outlet), MFA 0290A-0001-ind 1 (special O<sup>2</sup> outlet) and MFA 0290D-0001-ind 1 (O<sub>2</sub> ISO outlet)

Weight < 0.45 kg

Operates in any position

All marked plastic parts shall use identification according to [ISO 11469]

### **2.2 Electrical status (*Given for information only*)**

*The nominal driving voltage level is 24 VDC*

*The blower motor could withstand a driving voltage level up to 28V (Non continuous operation)*

*Motor clocked for CW rotation*

*Hall sensor voltage supply: 5V ±20%*

*Hall sensor output voltage 0/5 V level according to hall sensor Melexis US2881 or equivalent*

*Hall sensor duty cycle: 180° ±10°*

*Motor temperature is monitored with NTC thermistor. type Epcos B57421V2 103J62*

*Insulation resistance 100 Mohm (Between motor housing and phases – supply voltage 100 VDC during 5 seconds)*

*Wire flame resistance: UL VW1*

### Motor standalone Parameters (at 25°C)

	Unit	Min	Typ.	Max
<i>Phase-Phase resistance</i>	<i>Ohm</i>	<i>0,68</i>	<i>0,75</i>	<i>0,83</i>
<i>Torque constant</i>	<i>nNm/A</i>	<i>3,21</i>	<i>3,49</i>	<i>3,76</i>
<i>Back EMF constant</i>	<i>V/Krpm</i>	<i>0,336</i>	<i>0,365</i>	<i>0,394</i>
<i>Phase-Phase Inductance</i>	<i>mH</i>		<i>0,25</i>	
<i>Mechanical Time Constant</i>	<i>ms</i>		<i>8,0</i>	
<i>Electrical Time Constant</i>	<i>ms</i>		<i>0,33</i>	
<i>Thermal Resistance</i>	<i>°C/W</i>		<i>20</i>	

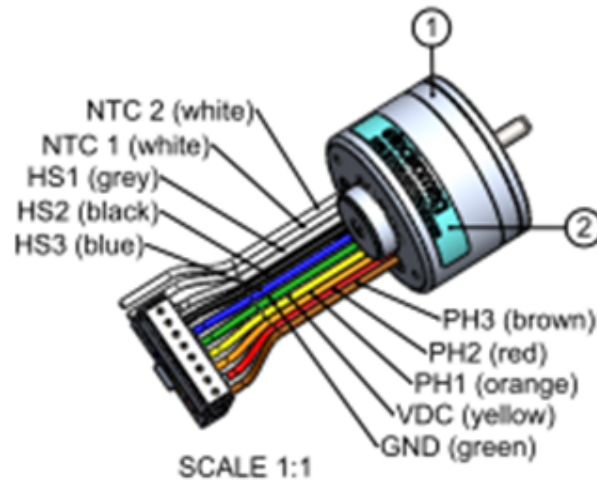
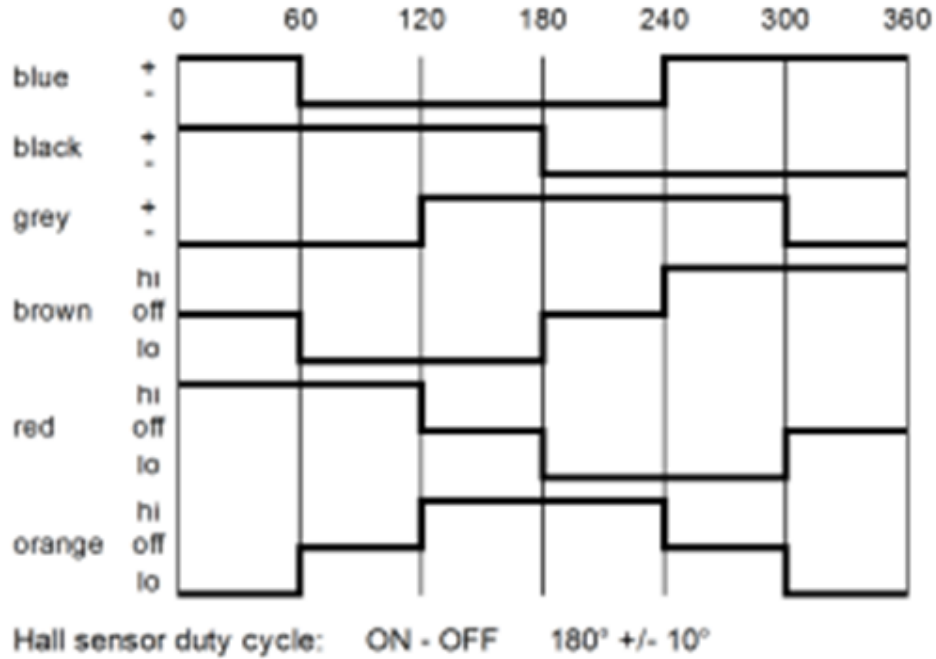
### Motor standalone Dynamic Parameters (at 25°C) and 24 VDC

No load	Unit	Min	Typ.	Max
<i>Current</i>	<i>mA</i>	<i>160</i>	<i>200</i>	<i>240</i>
<i>Speed</i>	<i>Rpm</i>	<i>60381</i>	<i>60342</i>	<i>71149</i>
<i>Electrical Input Power</i>	<i>W</i>	<i>3,8</i>	<i>4,8</i>	<i>5,8</i>

Peak Efficiency	Unit	Min	Typ.	Max
<i>Current</i>	<i>A</i>		<i>2,53</i>	
<i>Torque</i>	<i>mNm</i>		<i>8,1</i>	
<i>Speed</i>	<i>Rpm</i>		<i>60555</i>	
<i>Electrical Input Power</i>	<i>W</i>		<i>60,7</i>	
<i>Efficiency</i>	<i>%</i>		<i>85</i>	

Stall	Unit	Min	Typ.	Max
<i>Current</i>	<i>A</i>		<i>32,0</i>	
<i>Torque</i>	<i>mNm</i>		<i>111,5</i>	
<i>Electrical Input Power</i>	<i>W</i>		<i>768,0</i>	

## Truth Table & Wiring:



### 2.3 Noise and vibrations

Static pressure at 0 flow.	60 hPa	30 hPa	10 hPa
Maximum Vibration Level (g)	0.2	0.10	0.02
Maximum Noise Level (dBA)	48	41	29

*Performances measured with AIRFAN Controller MFA0900 or Maxon DEC 50/ Ref: 230572  
Blower housing at 1meter from sonometer.*

### 3 PERFORMANCE

	Performance	Conditions
Zero flow output pressure	> 70 hPa	@ 24 VDC and zero flow
Max Flow without losses except flow meter	>240 l/mn $\Delta P = 21$ hPa	@ 24 VDC and without losses (except flow meter)
Cooling flow	>22 l/min	@ 80 hPa and zero flow
Electric input power at high flow	< 55W	@ 40 hPa & 200 l/min, 24VDC
Pressure rise time 5-30 hPa	< 100 ms	@ 3.0 A & 24 VDC Flow<15l/mn

*Performances measured with AIRFAN Controller MFA0900 or Maxon DEC 50/ Ref: 230572  
All performance referenced to 1013 hPa and 21°C*

## 4 LIFE EXPECTANCY

The monitoring PCB motor temperature should not exceed 70°C (158°F) at stabilized conditions.

Life Expectancy (L10) > 40 000 operating hours following Airfan standard.

- ✓ 25°C air inlet temp.
- ✓ 21% O2 Air inlet
- ✓ Ambient temperature = Air inlet temperature.
- ✓ Cycling = 20 BPM
- ✓ 1s @ 35 hPa
- ✓ 2s @ 5 hPa
- ✓ Max Air flow: 25 l/mn
- ✓ Rise time & Fall time: < 100ms
- ✓ Motor controller MFA0900 or Maxon DEC 50/ Ref: 230572

## 5 ENVIRONMENTAL CONDITIONS

### 5.1 Transport and storage conditions

		Conditions
Transport and storage temperature range	-25 - +60°C	Maximum 2 months at temperatures above 40°C, due to aging of grease in bearings
Transport and storage atmospheric pressure range	470 – 1060 mbar	
Transport and storage relative humidity	0- 95%RH , non-condensing	



## 5.2 Operating conditions

		Conditions
Operating ambient temperature range	+10 - +50°C	Air inlet temperature up to +40°C
Operating atmospheric pressure range	660 – 1060 mbar	max output pressure level will be reduced to approx. 65% at 660 hPa
Operating relative humidity range	15 – 95 %RH, non-condensing	
Blower sealing	< 1,1 l/mn	Internal pressure 20 hPa All output or inlet ports closed

## 6 ACCEPTANCE TESTS

Each blower is checked according to the following performances:

- Temperature sensor test (room temperature)
- Over-speed test
- Maximum pressure at 0 flow and 24 VDC
- Power consumption at the functional point 80 hPa and 0 Flow
- Power consumption at the functional point 40 hPa and 200 l/mn
- Cooling flow at 24 VDC
- Blower sealing at 20 hPa

Tests documentation covering all performance measurements according to §6 is archived by AIRFAN for at least 10 years after the date of the last manufactured equipment.

## 7 MARKING

The blower unit has a label with:

- Airfan reference and issue + Bar Cod 128 (B codage)
- Batch number
- Serial number

## **8 PACKING REQUIREMENTS**

Each unit is packaged in a dissipative ESD bag and then in individual boxes. 12 blowers bundled together into a card board box with dimensions L 430 x W 310 x H 250 mm.

## **9 DELIVERY**

All shipments are accompanied by a “Certificate of Conformance” where for each one of the units we guarantee that:

- they are identical to the defined version
- each unit has been tested according to § 6

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