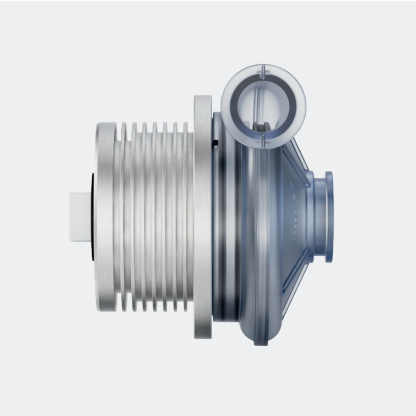
# Specification

## Radial Blower U85MX-024KX-4



### General Information

| Item | |
|---|---|
| Product type | Radial blower with integrated electronic motor driver |
| Part no. | U85MX-024KX-4<br>U85MX-024KX-41 with inlet port (option)<br>U85MX-024KX-42 with outlet port (option)<br>U85MX-024KX-43 with inlet and outlet port (option) |
| Customer | N/A |
| Project no. | N/A |
| Modification | Standard product |

### Description

The versatile, high-power blower can be widely used for industrial or medical applications, where highest vacuum or pressure performance is needed, i.e. for cough therapy, dental suction, vacuum handling and many more.

SWISS ENGINEERED

CE

REACh Compliant

RoHS III Compliant

### Features

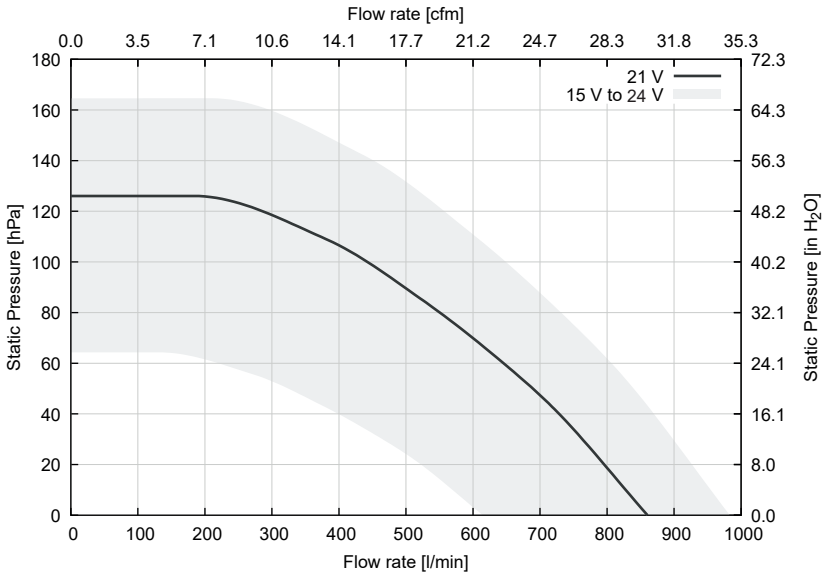
- Static pressure: 123 hPa, freeflow: 860 l/min
- 21 $V_{DC}$ brushless DC-motor
- Analog speed control and tacho frequency signal
- Highly efficient, quiet operation
- Aluminum heat sink
- Mounting flange with holes
- 40 % oxygen resistant airway

### General Conditions

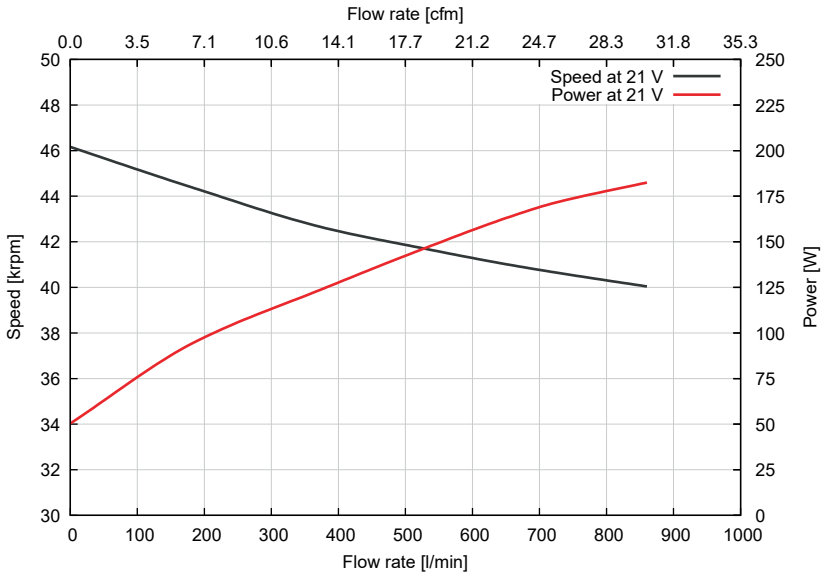
Unless otherwise stated all data are measured at nominal voltage and are valid at 20 °C ambient temperature and 1.2 kg/m³ standard air density. Values listed are nominal and can vary depending on the installation conditions and due to component tolerances. Test setup according to ISO 5801 with standardized inlet and outlet chambers. Tolerances based on specified speed data according to ISO 13348, grade 4: pressure +/-10 %, power +16 %. Tolerances based on constant voltage: speed +/-10 %, pressure +/-21 %, power +33 %. For continuous blower operation please refer to specified maximum ratings. Performance data outside normal operating range plotted for information only.

## Performance

### Pressure vs. Flow Characteristics




### Speed and Power vs. Flow Characteristics




| Shut-Off in Pressure Operation (Zero Flow Rate) | Unit | Value |
|---|---|---|
| Static pressure | [hPa] | 123 |
| Power consumption | [W] | 51 |
| Speed | [rpm] | 46160 |

| Shut-Off in Vacuum Operation (Zero Flow Rate) | | |
|---|---|---|
| Static pressure | [hPa] | 114 |
| Power consumption | [W] | 48 |
| Speed | [rpm] | 45760 |

| Free-Air (Zero Static Pressure) | | |
|---|---|---|
| Flow rate | [l/min] | 860 |
| Power consumption | [W] | 183 |
| Speed | [rpm] | 40040 |

## Technical Data

| Electrical | Unit | Value |
|---|---|---|
| Nominal supply voltage | [$V_{DC}$] | 21 |
| Supply voltage range | [$V_{DC}$] | 15 to 24 |
| Minimum power supply current[1] | [A] | N/A |
| Maximum start-up time | [s] | N/A |
| Maximum ripple voltage | [%] | 5 |
| **Maximum Ratings for Continuous Operation** | | |
| Minimum flow rate | [l/min] | 80 |
| Maximum speed | [rpm] | 45 000 |
| Maximum acceleration | [rpm/ms] | N/A |
| Maximum power consumption | [W] | 160 |
| Maximum housing surface temperature | [°C] | 65 |
| Maximum NTC temperature | [°C] | N/A |
| **Environmental** | | |
| Ambient temperature (operating) | [°C] | -20 to 45 |
| Ambient temperature (storage) | [°C] | -20 to 65 |
| Relative humidity (non-condensing) | [% RH] | 10 to 85 |
| Ingress protection (EN60529) | | IP40 |
| Maximum oxygen concentration[2] | [%] | 21 |
| **Motor** | | |
| Type | | Brushless direct current motor |
| Winding insulation class | | F, 155 °C |
| NTC type | | TDK NTCG164KF104F<br>-40 °C to 125 °C,<br>100 kΩ, $B_{25/100}$ = 4 508 K |
| **Lifetime** | | |
| L10 at 25 °C ambient temperature[3] | [h] | 20 000 |
| **Acoustics** | | |
| Sound pressure level | [dB(A)] | N/A |
| **Leak Tightness** | | |
| Maximum leak flow rate | [l/min] | N/A |
| **Mechanical** | | |
| Blower weight | [g] | 390 |

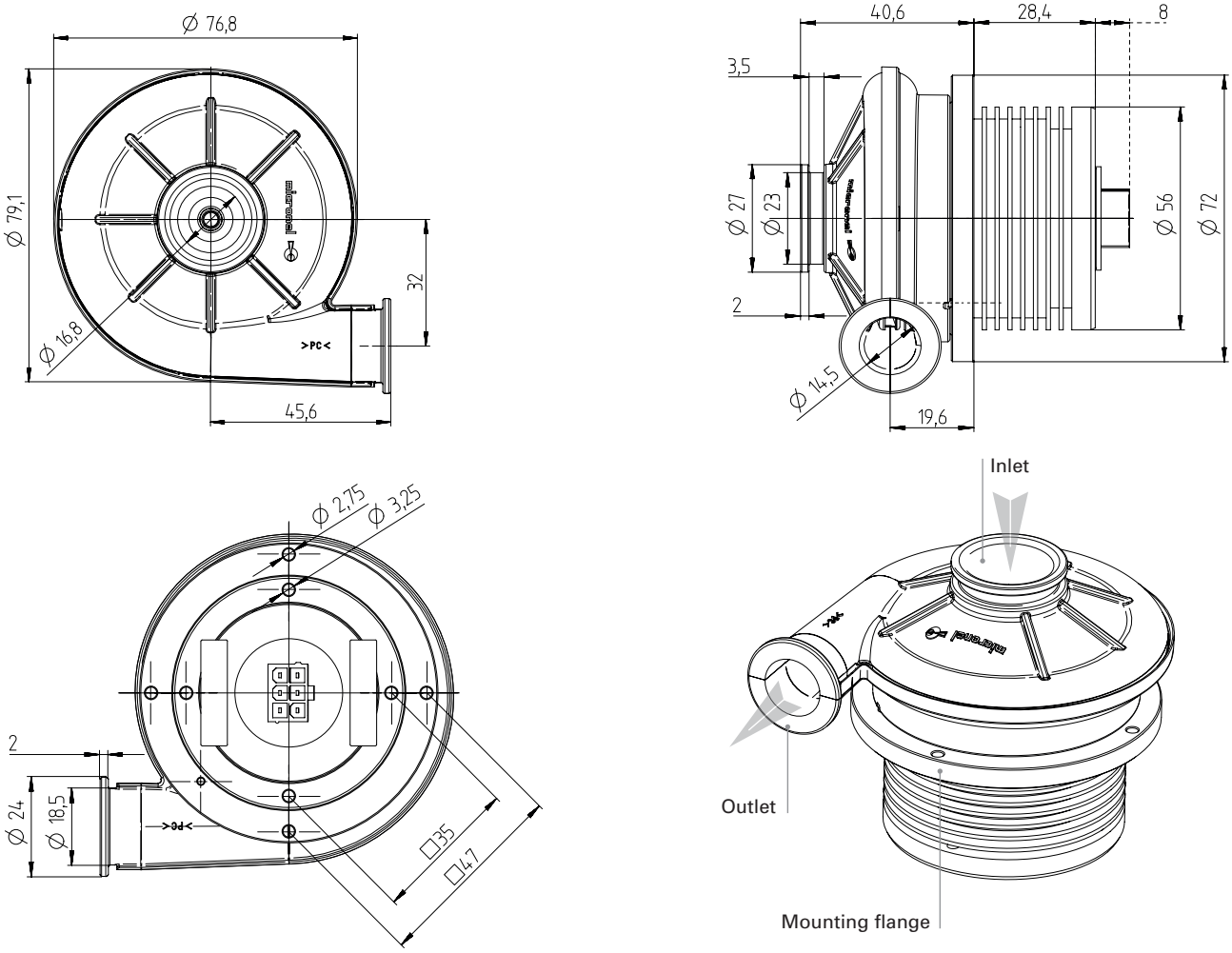
[1] Recommended minimum continuous power supply current for proper start-up behavior at nominal voltage. This is an indicative value. Power supply dimensioning, wiring, safety, setup and validation is the customer's responsibility.

[2] Micronel blowers are designed for various levels of oxygen compatibility. Further information available on request.

[3] Accelerated aging test at 45 °C ambient temperature, continuous operation, flow control with 4.5 mm diameter orifice plate at outlet, normal cleanliness according to ISO 281. Temperature dependency of lifetime according to IPC-9591: factor 1.5 per 10 °C.

## Drawings

Dimensions in mm




| Orientations | |
|---|---|
| Direction of rotation | Counter-clockwise (view on inlet) |
| Mounting position | Any direction |

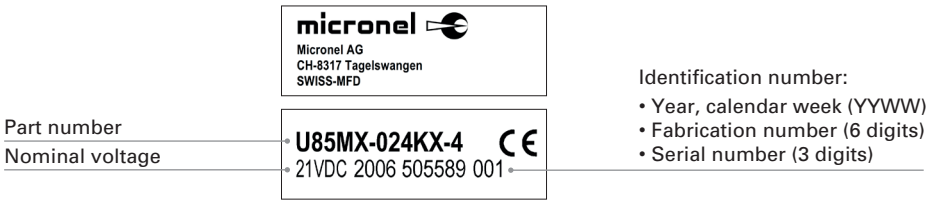
## Materials

| Components | Material |
|---|---|
| Fan housing | Polycarbonate (PC)<br>Flammability: 850 °C /<br>1 mm (IEC 60695-2-12)<br>Biocompatibility: USP Class VI / ISO 10993 |
| Impeller | Polyamide (PA6) |
| Hub | Stainless steel |
| Motor housing | Zinc die cast<br>Aluminum, anodized, natural color |
| Label | Polyester,<br>Flammability: UL 969 |
| Connector | Molex 46015-0603<br>Flammability: UL 94V-0 |
| Crimp terminal | N/A |
| Lead wire | N/A |

## Identification

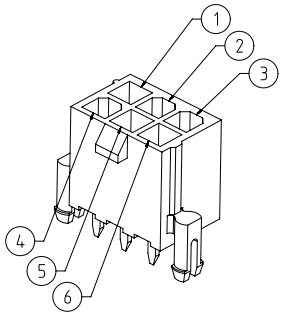
### Label

Design




## Blower Pinout

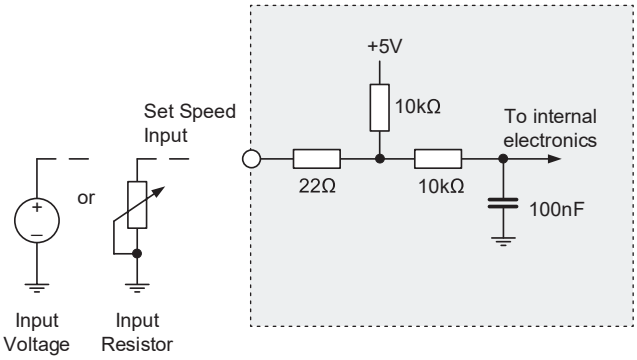
| Pin | Color | Description | AWG |
|---|---|---|---|
| 1 | - | GND | - |
| 2 | - | Tachometer output | - |
| 3 | - | NTC | - |
| 4 | - | $V_{cc}$ | - |
| 5 | - | Set speed input | - |
| 6 | - | NTC | - |

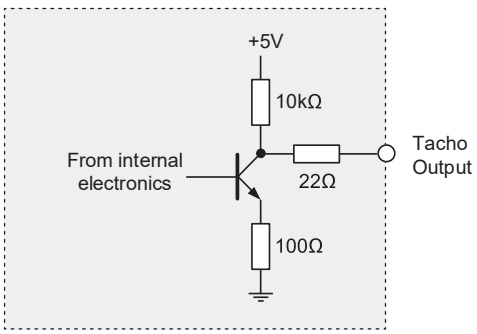



## Electronic Functions

### Integrated Electronic Motor Driver

| | |
|---|---|
| Type | Micronel brushless direct current motor driver |
| Features | • Integrated speed control (analog / resistive)<br>• Tachometer frequency signal<br>• Locked rotor protection<br>• No polarity protection |




### Speed Control Input

The blower speed can be controlled by either input voltage or input resistor value. See „Set Speed Input“ table for further details.

### Tachometer Output

Tachometer frequency:
3 pulses per revolution

**n = 20 • f**

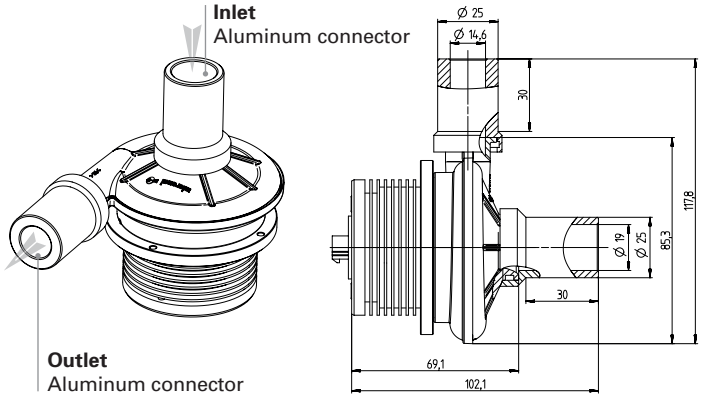
**n** Rotation speed [rpm]
**f** Tacho frequency [Hz]

## Electronic Functions

| Set Speed Input Voltage [$V_{DC}$] | Operation Mode |
|---|---|
| Set speed not connected | Blower speed at 100 % |
| < 0.0 | Not allowed |
| 0.0 to 0.2 | Stop |
| 0.2 to 1.5 | Not defined, blower might run or stop |
| 2.0 | Minimum start-up voltage |
| 1.5 to 4.0 (after start-up) | Blower speed dependent on external voltage |
| 4.0 to 5.0 | Blower speed at 100 % |
| > 5.0 | Not allowed |

| Set Speed Input Resistor [kΩ] | Operation Mode |
|---|---|
| Set speed not connected | Blower speed at 100 % |
| 0.0 to 0.5 | Stop |
| 0.5 to 4.3 | Not defined, blower might run or stop |
| 6.7 | Minimum start-up resistance |
| 4.3 to 39 (after start-up) | Blower speed dependent on external resistance |
| > 39 or open input | Blower speed at 100 % |

## Options for Inlet and Outlet Connections*




| Part no. with options | Inlet | Outlet |
|---|---|---|
| U85MX-024KX-4 | | |
| U85MX-024KX-41 | ● | |
| U85MX-024KX-42 | | ● |
| U85MX-024KX-43 | ● | ● |

* The drawings show inlet and outlet connectors. Both options are independet of each other.

**No application of forces on connectors allowed!**

## Accessories

Not included!

**Micronel Conector-Set M450X-527A9**

**Suitable for blower**

Micronel Radial Blower
U85MX-024KX-4

Handle in power-off conditions only!
Read operating manual!

Please see separate accessories list or contact Micronel Sales for a full list of options and accessories.



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