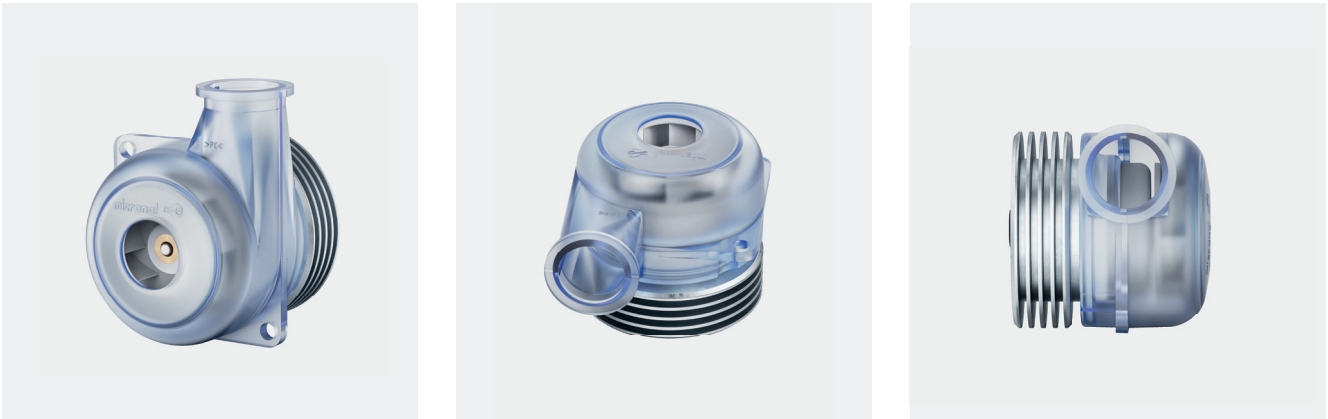


Specification

Radial Blower U51DL-024KK-4



General Information

| Item | |
|--------------|---|
| Product type | Radial blower with integrated electronic motor driver |
| Part no. | U51DL-024KK-4 U51DL-024KK-42 with outlet nozzle (option) U51DL-024KK-43 with inlet and outlet nozzle (option) |
| Customer | N/A |
| Project no. | N/A |
| Modification | Standard product |

Description

This versatile and compact 24 VDC blower is the ideal choice for mobile medical respiration devices. It provides an integrated brushless driver with set-speed input and tacho output and is optionally available with an inlet nozzle.



Features

- Static pressure: 54 hPa, freeflow: 500 l/min
- 24 V_{DC} brushless DC-motor
- Speed control and tacho frequency signal
- Small dimensions through slim design
- Options for in- and outlet ports

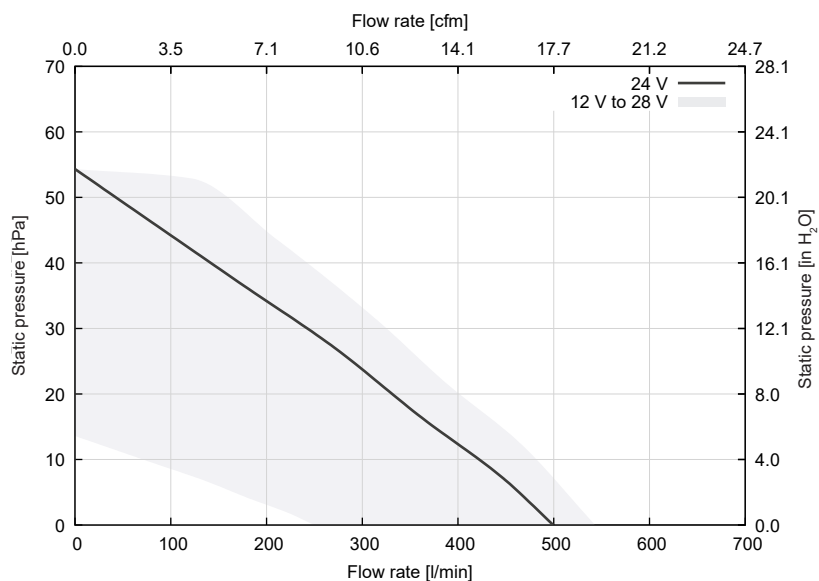


General Conditions

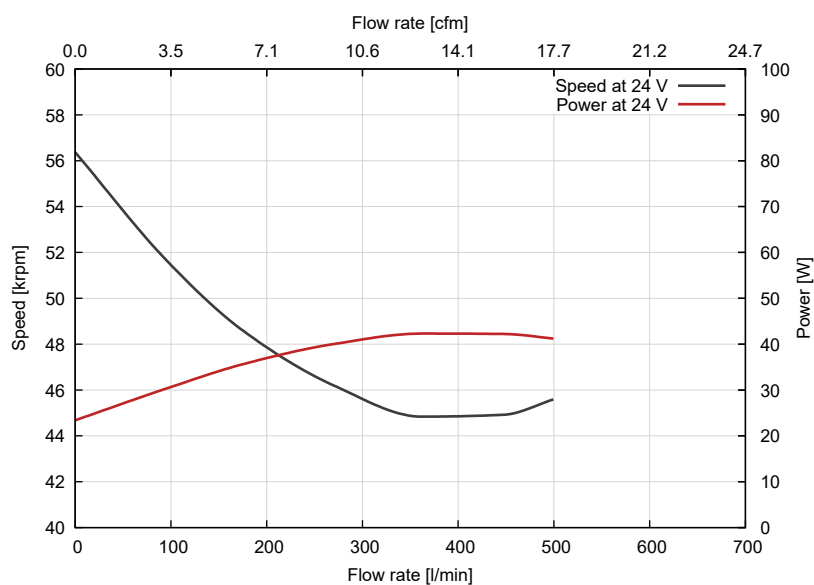
Unless otherwise stated all data are measured at nominal voltage and are valid at 20 °C ambient temperature and 1.2 kg/m³ standard air density. Values listed are nominal and can vary depending on the installation conditions and due to component tolerances. Test setup according to ISO 5801 with standardized 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] | 54 |
| Power consumption | [W] | 23 |
| Speed | [rpm] | 56 400 |

Shut-Off in Vacuum Operation (Zero Flow Rate)

| | | |
|-------------------|-------|--------|
| Static pressure | [hPa] | 51 |
| Power consumption | [W] | 23 |
| Speed | [rpm] | 56 400 |

Free-Air (Zero Static Pressure)

| | | |
|-------------------|---------|--------|
| Flow rate | [l/min] | 500 |
| Power consumption | [W] | 41 |
| Speed | [rpm] | 45 600 |

Technical Data

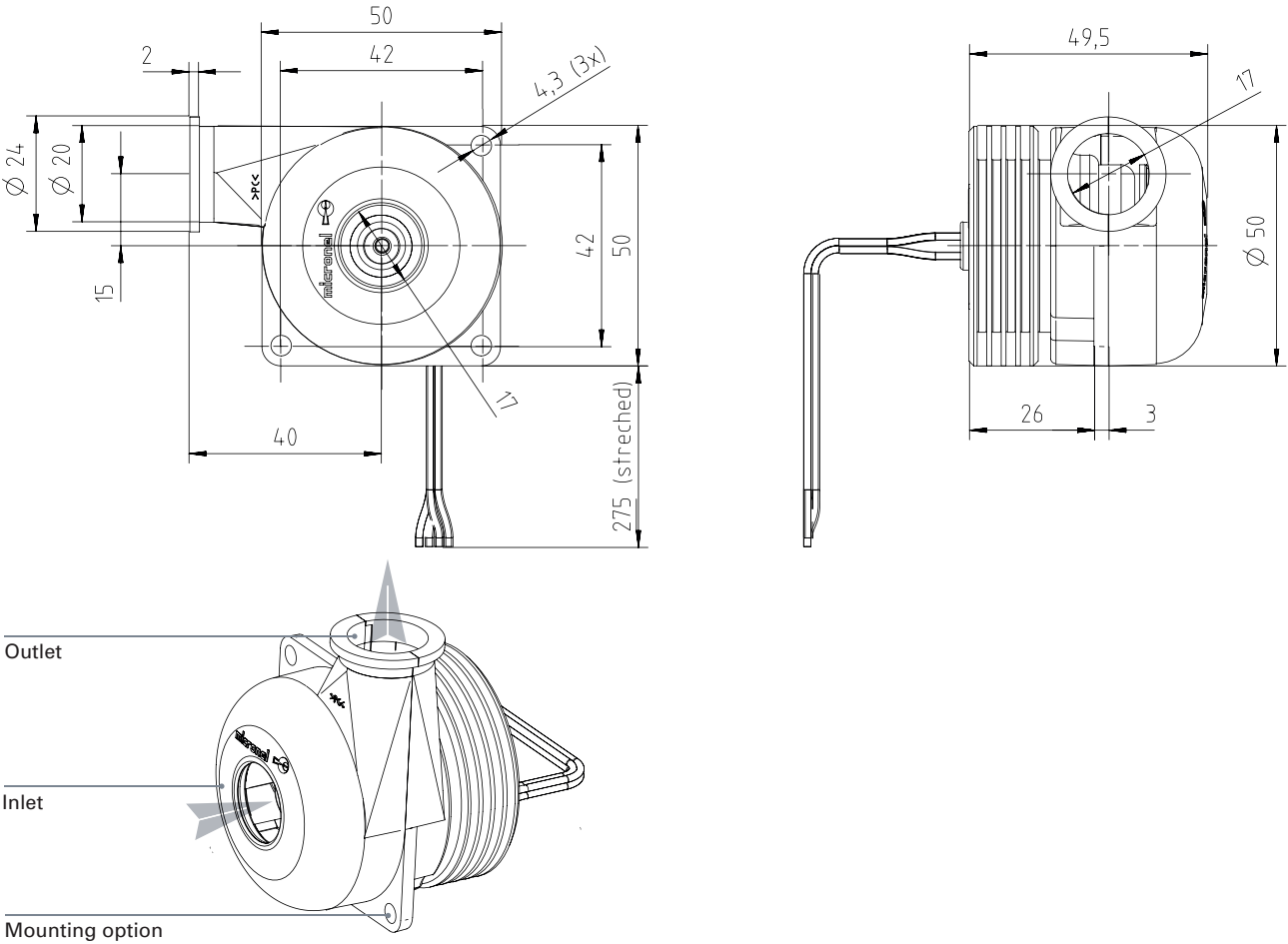
| Electrical | Unit | Value |
|---|--------------------|--------------------------------|
| Nominal supply voltage | [V _{DC}] | 24 |
| Supply voltage range | [V _{DC}] | 12 to 28 |
| Minimum power supply current ⁽¹⁾ | [A] | N/A |
| Maximum start-up time | [s] | N/A |
| Maximum ripple voltage | [%] | 5 |
| Maximum Ratings for Continuous Operation | | |
| Minimum flow rate | [l/min] | N/A |
| Maximum speed | [rpm] | 50 000 |
| Maximum acceleration | [rpm/ms] | N/A |
| Maximum power consumption | [W] | 43 |
| Maximum housing surface temperature | [°C] | 75 |
| Maximum NTC temperature | [°C] | N/A |
| Environmental | | |
| Ambient temperature (operating) | [°C] | -20 to 50 |
| Ambient temperature (storage) | [°C] | -20 to 50 |
| Relative humidity (non-condensing) | [%RH] | 10 to 85 |
| Ingress protection (EN60529) | | IP40 |
| Maximum oxygen concentration | [%] | 21 |
| Motor | | |
| Type | | Brushless direct current motor |
| Winding insulation class | | F, 155 °C |
| NTC type | | N/A |
| Lifetime | | |
| L10 at 25 °C ambient temperature ⁽²⁾ | [h] | 10 000 |
| Acoustics | | |
| Sound pressure level | [dB(A)] | N/A |
| Leak Tightness | | |
| Maximum leak flow rate | [l/min] | N/A |
| Mechanical | | |
| Blower weight | [g] | 120 |

⁽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⁾ Lifetime test at 25 °C ambient temperature, Ø 6.52 mm orifice at outlet, continuous operation, 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 |
|----------------|---|
| Blower housing | Polycarbonate (PC), transparent Flammability: 850 °C / 1 mm (IEC 60695-2-12) Biocompatibility: USP Class VI / ISO 10993 |
| Impeller | Polyamide (PA 6), white |
| Hub | Brass |
| Motor housing | Aluminum anodised, natural colour |
| Label | PET |
| Connector | N/A |
| Crimp terminal | N/A |
| Lead wire | PVC Flammability: UL 1007 |

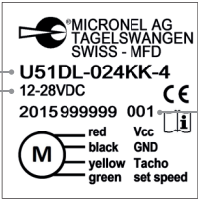
Identification

Label

Design

Part number

Voltage range



Identification number:

- Year, calendar week (YYWW)
- Fabrication number (6 digits)
- Serial number (3 digits)

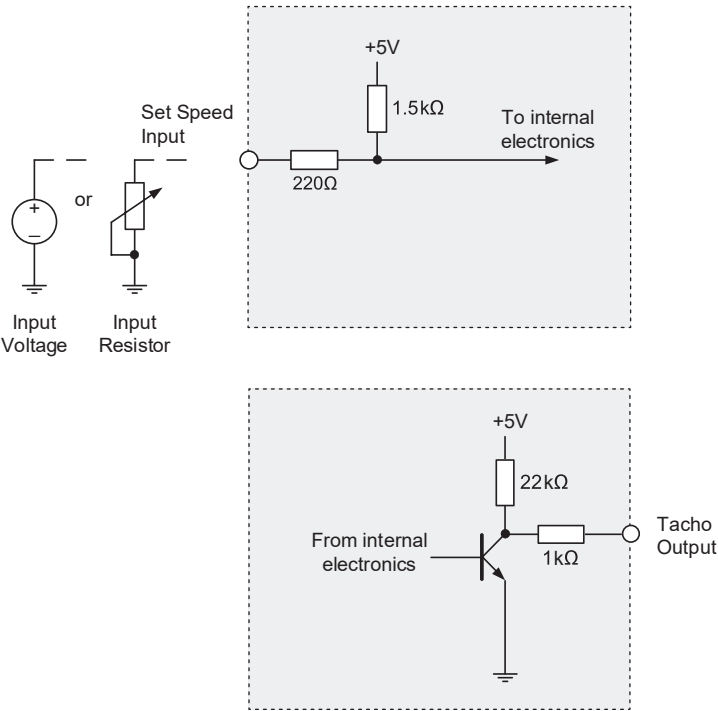
Blower Pinout

| Pin | Color | Description | AWG |
|-----|--------|-------------------|-----|
| 1 | Red | V _{CC} | 24 |
| 2 | Black | GND | 24 |
| 3 | Yellow | Tachometer output | 24 |
| 4 | Green | Set speed input | 24 |

Electronic Functions

Integrated Electronic Motor Driver

| | |
|----------|--|
| Type | Sensorless brushless direct current motor driver |
| Features | <ul style="list-style-type: none">• Integrated speed control (voltage/resistor)• Tachometer frequency signal• Locked rotor protection• Thermal protection• Polarity protection |



Speed Control Input

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

Tachometer Output

Tachometer frequency:
3 pulses per revolution

$n = 20 \cdot f$

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

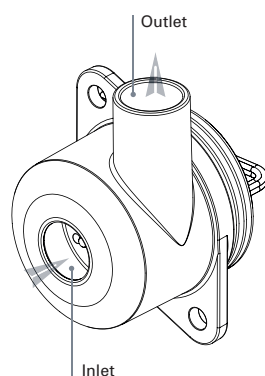
Electronic Functions

| Set Speed Input Voltage [V _{bc}] | Operation Mode |
|--|---|
| Set speed not connected | Blower speed at 100 % |
| Set speed to ground | Stop |
| 0.0 to 0.5 | Stop |
| 0.5 to 2.0 | Not defined, blower might run or stop |
| 2.0 | Minimum start-up voltage |
| 2.0 to 4.4 | Blower speed depending on input voltage |
| 4.4 to 5.0 | Blower speed at 100 % |

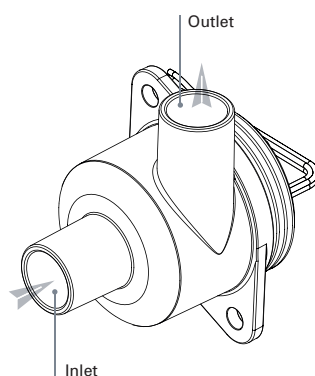
| Set Speed Input Resistor [kΩ] | Operation Mode |
|-------------------------------|--|
| Set speed not connected | Blower speed at 100 % |
| Set speed to ground | Stop |
| 0.0 to 0.4 | Stop |
| 0.4 to 1.2 | Not defined, blower might run or stop |
| 1.2 | Minimum start-up resistance |
| 1.2 to 7.5 | Blower speed depending on resistor value |
| > 7.5 or open input | Blower speed at 100 % |

Options for Inlet and Outlet Nozzles

Micronel Radial Blower
U51DL-024KK-42



Micronel Radial Blower
U51DL-024KK-43

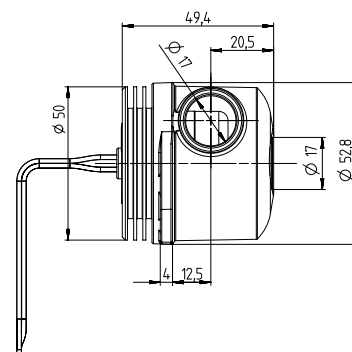
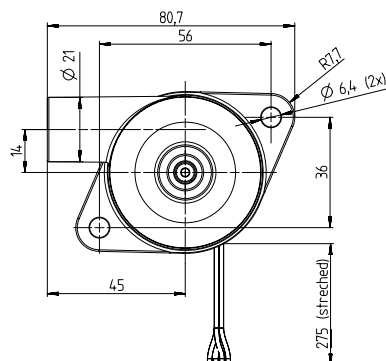


| Article with options | Inlet nozzle | Outlet nozzle |
|------------------------------|--------------|---------------|
| Radial Blower U51DL-024KK-4 | | |
| Radial Blower U51DL-024KK-42 | | ● |
| Radial Blower U51DL-024KK-43 | ● | ● |

Options for Inlet and Outlet Nozzles

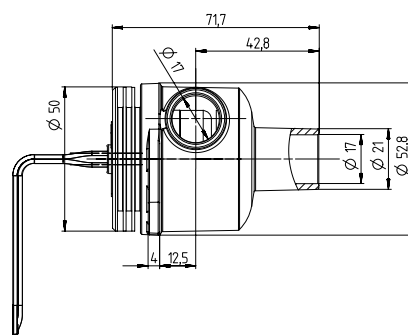
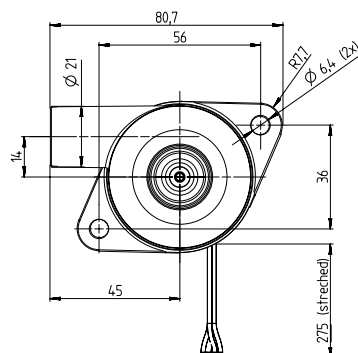
Micronel Radial Blower

U51DL-024KK-42



Micronel Radial Blower

U51DL-024KK-43



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.