

Specification

Radial Blower U51HP-012KM-43



General Information

Item

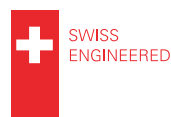
| | |
|--------------|---|
| Product type | Radial blower with integrated electronic motor driver |
| Part no. | U51HP-012KM-43 U51HP-012KM-42 (option with outlet port only) |
| Customer | N/A |
| Project no. | N/A |
| Modification | Standard product |

Description

This compact 12 V_{DC} multi-purpose blower can be used for various industrial pressure and vacuum applications. It provides an integrated brushless driver with set-speed input and tacho output and is optionally available without nozzle.

Features

- Static pressure: 26 hPa, freeflow: 380 l/min
- 12 V_{DC} brushless DC-motor
- Analog speed control and tacho frequency signal
- Compact design
- Mounting flange with holes
- Options with or without inlet port

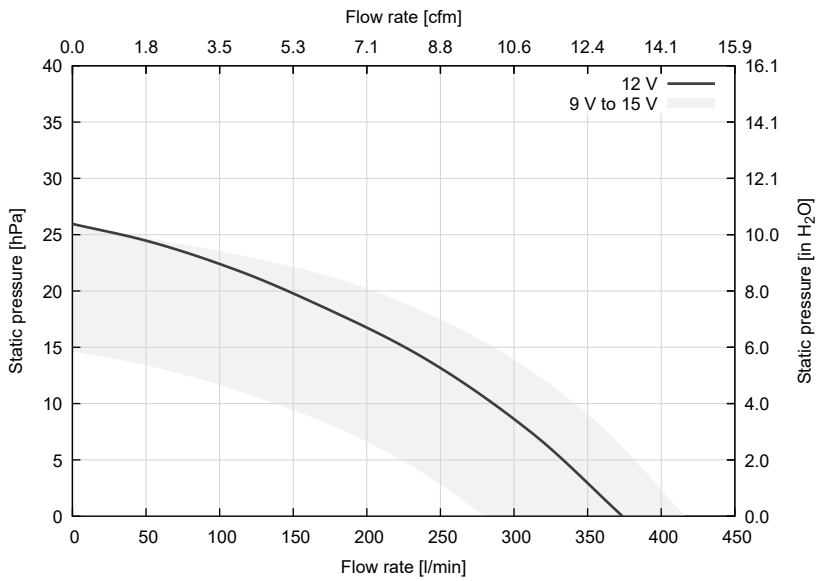


General Conditions

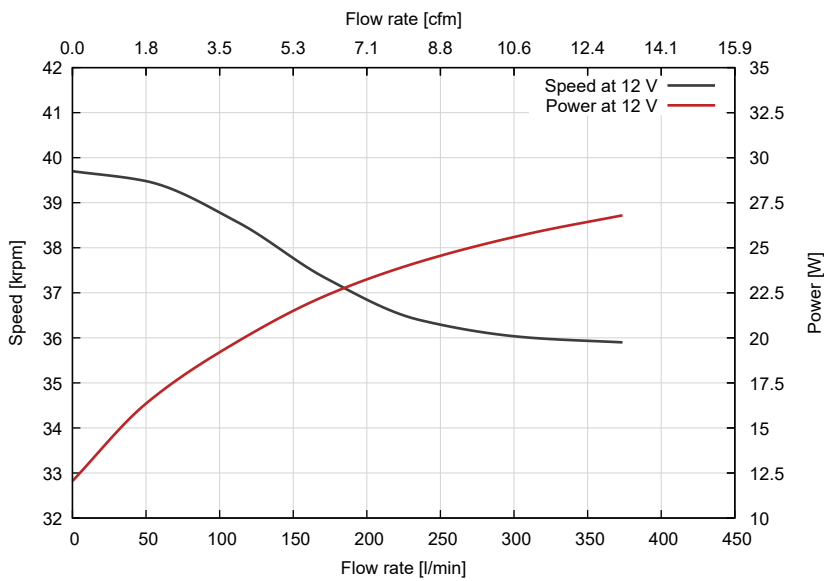
Unless otherwise stated all data are measured at nominal voltage and are valid at 20 °C ambient temperature and 1.2 kg/m³ standard air density. Values listed are nominal and can vary depending on the installation conditions and due to component tolerances. Test setup according to ISO 5801 with standardized 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] | 26 |
| Power consumption | [W] | 12 |
| Speed | [rpm] | 39 700 |

Shut-Off in Vacuum Operation (Zero Flow Rate)

| | | |
|-------------------|-------|--------|
| Static pressure | [hPa] | 25 |
| Power consumption | [W] | 16 |
| Speed | [rpm] | 39 700 |

Free-Air (Zero Static Pressure)

| | | |
|-------------------|---------|--------|
| Flow rate | [l/min] | 380 |
| Power consumption | [W] | 27 |
| Speed | [rpm] | 36 000 |

Technical Data

| Electrical | Unit | Value |
|---|--------------------|---------|
| Nominal supply voltage | [V _{DC}] | 12 |
| Supply voltage range | [V _{DC}] | 9 to 15 |
| 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] | 0 |
| Maximum speed | [rpm] | 39 700 |
| Maximum acceleration | [rpm/ms] | N/A |
| Maximum power consumption | [W] | 27 |
| Maximum housing surface temperature | [°C] | 65 |
| Maximum NTC temperature | [°C] | N/A |

Environmental

| | | |
|---|-------|-----------|
| Ambient temperature (operating) | [°C] | -20 to 60 |
| Ambient temperature (storage) | [°C] | -20 to 60 |
| 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 | | H, 180 °C |
| NTC type | | N/A |

Lifetime

| | | |
|---|-----|--------|
| L10 at 25 °C ambient temperature ⁽³⁾ | [h] | 20 000 |
|---|-----|--------|

Acoustics

| | | |
|-------------------------------------|---------|----|
| Sound pressure level ⁽⁴⁾ | [dB(A)] | 33 |
|-------------------------------------|---------|----|

Leak Tightness

| | | |
|------------------------|---------|-----|
| Maximum leak flow rate | [l/min] | N/A |
|------------------------|---------|-----|

Mechanical

| | | |
|---------------|-----|-----|
| Blower weight | [g] | 150 |
|---------------|-----|-----|

⁽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.

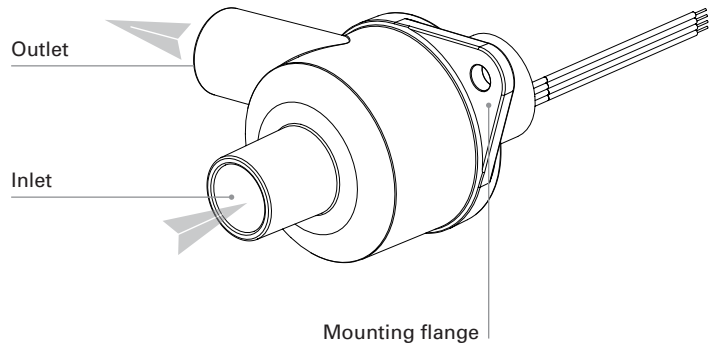
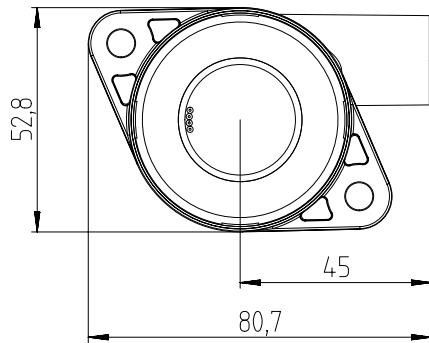
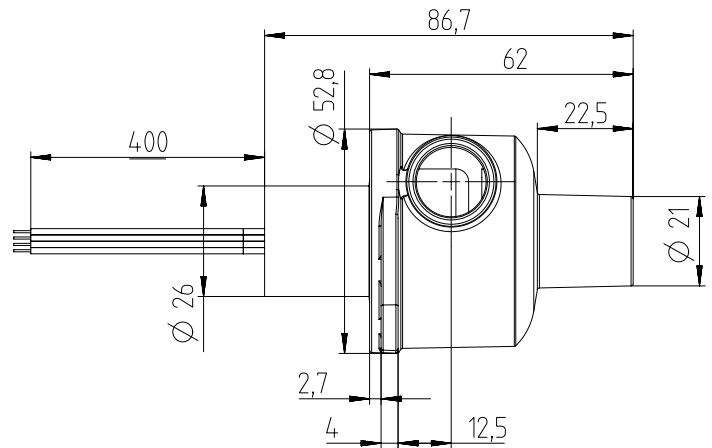
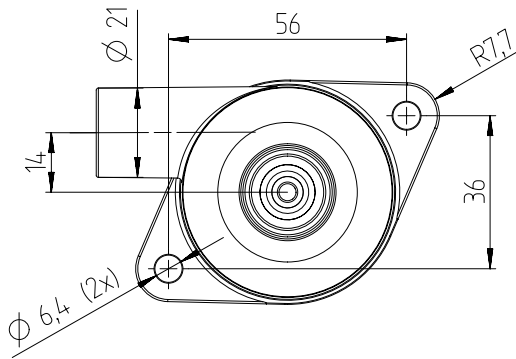
⁽²⁾ Micronel blowers are designed for various levels of oxygen compatibility. Further information available on request.

⁽³⁾ Accelerated aging test at 45 °C ambient temperature, continuous operation 11.5 h ON, 0.5 h OFF, normal cleanliness according to ISO 281. Temperature dependency of lifetime according to IPC-9591: factor 1.5 per 10 °C.

⁽⁴⁾ Measured at distance of 1 meter from blower axis, with hose connected to inlet and outlet.

Drawings

Dimensions in mm



Orientations

Direction of rotation

↻ Counter-clockwise (view on inlet)

Mounting position

Any direction

Materials

Components

Material

Blower housing

Acrylnitril-Butadien-Styrol (ABS), black

Impeller

Polyamide (PA6), white

Hub

-

Motor housing

Aluminum

Label

Plastic, 26 x 26 mm
Flammability: UL 969

Connector

N/A

Crimp terminal

N/A

Lead wire

Silicone insulated cable
Flammability: UL 3239

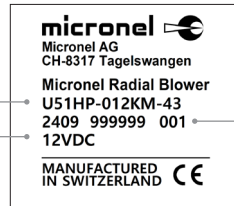
Identification

Label

Design

Part number

Nominal voltage



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

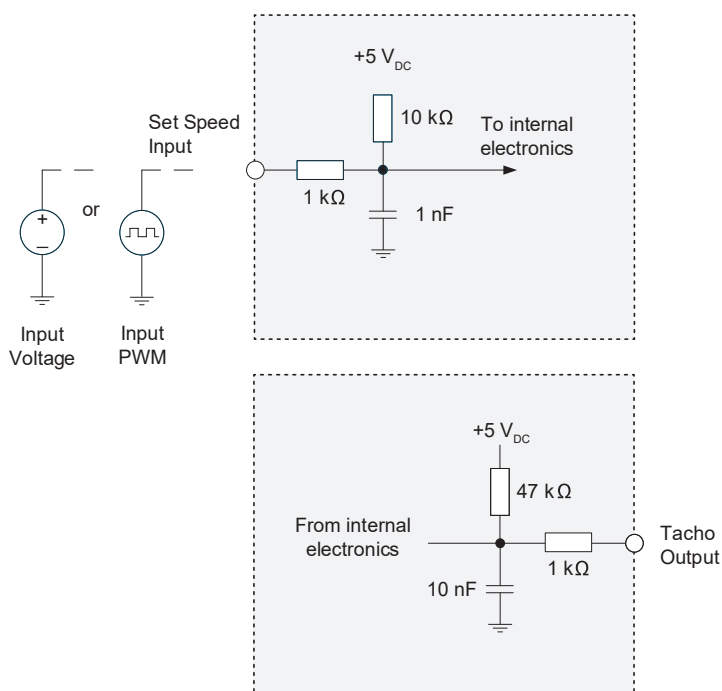
Integrated Electronic Motor Driver

Type

Micronel brushless direct current motor driver

Features

- Integrated speed control (PWM)
- Tachometer frequency signal
- Over temperature protection
- Locked rotor protection
- Hall fault protection
- Over current protection



Speed Control Input

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

Tachometer Output

Tachometer frequency:
1 pulse per revolution

$$n = 60 \cdot f$$

n Rotation speed [rpm]

f Tacho frequency [Hz]

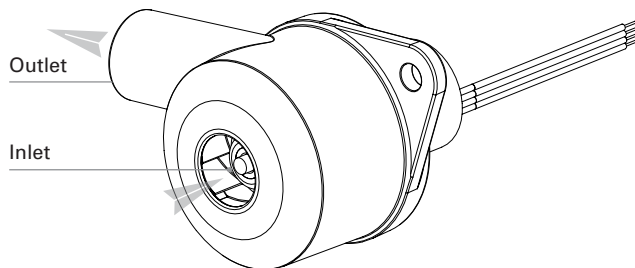
Electronic Functions

| Set Speed Input Voltage [V _{dc}] | Operation Mode |
|--|---|
| Set Speed not connected | Blower speed at 100 % |
| Set Speed to ground | Stop |
| 0.0 | Stop |
| 0.1 to 0.9 | Not defined, blower might run or stop |
| 1.0 | Minimum start-up |
| 1.0 to 4.5 | Blower speed depending on input voltage |
| 4.5 to 5.0 | Blower speed at 100 % |

| Set Speed Input PWM [%] | Operation Mode |
|-------------------------------|---------------------------------------|
| Set Speed not connected | Blower speed at 100 % |
| Set Speed to ground | Stop |
| 0.0 | Stop |
| 0.1 to 9.0 | Not defined, blower might run or stop |
| 10.0 to 90.0 (after start-up) | Blower speed depending on duty cycle |
| 90.0 to 100.0 | Blower speed at 100 % |

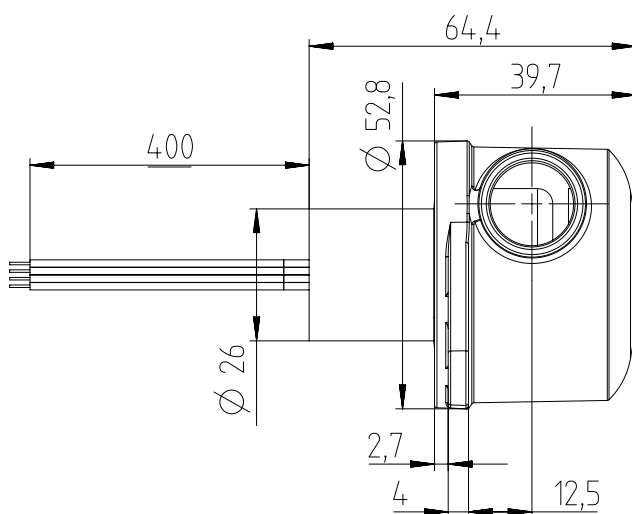
Frequency 10 kHz – 60 kHz; (TYP 20 kHz)

Options for Inlet and Outlet Connections*



| Part no. with options | Inlet | Outlet |
|-----------------------|-------|--------|
| U51HP-012KM-42 | | ● |
| U51HP-012KM-43 | ● | ● |

* The drawings show U51HP-012KM-42.



Note



Handle in power-off conditions only!
No application of forces on inlet and out-
let ports! Read operating manual!



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