

Condensing boiler technology

Product Catalogue 2021-03

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EC radial blowers for condensing boiler technology

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Information

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About ebm-papst.

As the leading supplier of ventilation and drive technology, ebm-papst is a highly respected engineering partner in many industries. With over 20,000 different products, we provide the right solution for just about any challenge. As the logical next stage in the development of our high-efficiency GreenTech EC technology, we believe that sustainably oriented industrial digitization offers the greatest future prospects for our customers. With GreenIntelligence, ebm-papst already offers intelligently interconnected complete solutions that are unrivaled worldwide and save energy costs and emissions.

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Six reasons that make us the ideal partner:

Our systems expertise.

You want the best solution for every project. The entire ventilation system must thus be considered as a whole. And that's what we do – with motor technology that sets standards, sophisticated electronics and aerodynamic designs – all from a single source and perfectly matched.

Our spirit of invention.

We are also always able to develop customized solutions for you with our versatile team of over 600 engineers and technicians.

Our lead in technology.

We are not only pioneers and trailblazers in the development of highly efficient EC technology, we also recognized the opportunities of digitization at an early stage. Therefore, we can offer solutions today that combine the highest energy efficiency with the advantages of IoT and digital networking.

Closeness to our customers.

ebm-papst has 29 production locations worldwide (including facilities in Germany, China and the USA), together with 48 sales offices, each of which has a dense network of sales representatives. You will always have a local contact, someone who speaks your language and knows your market.

Our standard of quality.

Our quality management is uncompromising, at every step in every process. This is underscored by our certification according to international standards including DIN EN ISO 9001, TS declaration of conformity and DIN EN ISO 14001.

Our sustainable approach.

Assuming responsibility for the environment, for our employees and for society is an integral part of our corporate philosophy. We develop products with an eye to maximum environmental compatibility, in particular resource-preserving production methods. We promote environmental awareness among our young staff and are actively involved in sports, culture and education. That's what makes us a leading company – and an ideal partner for you.

GreenIntelligence. *Making Engineers Happy.*



Why do our customers look so happy? Because when it comes to digitalization and sustainability, we provide them with a clear competitive edge with GreenIntelligence. The intelligent control and networking of fans and drives makes applications more powerful and efficient. Together with a long product life and highly efficient EC technology, we achieve lasting reductions in energy costs and emissions.

When it comes to **heating technology**, innovative, reliable, and energy-efficient products are needed. GreenIntelligence delivers solutions with smart networking capabilities that can be used to schedule service assignments as required and reduce variance. Furthermore, we are already preparing our gas/air composite systems for gas condensing boilers for climate-neutral use with hydrogen.

With our **comprehensive range of services**, we accompany you and your projects through every step in the process, from your application's planning to its deployment. Make use of our experts' product expertise to offer your customers new and advanced features. Or use our digital tools for optimal product selection. That will make your processes more efficient and get your products to market faster.

Now you know why ebm-papst makes engineers happy.



André opts for ready-to-install system solutions when it comes to condensing technology, which saves him a lot of adjustment effort.



Gas condensing technology

That's ebm-papst



Since creating the world's first gas blower for condensing technology, we have been the market leader for efficient components and complete, perfectly matched systems. We develop blowers, venturis, valves and burner controls together with our customers and supply everything as a full package. Enjoy the benefits of our well-established and constantly updated technology combined with unique system expertise.

More than just combustion

Modern gas condensing units are known for their productivity and efficient energy utilization. They have to be supplied with exactly the right amount of gas and air in an ideal ratio for every operating status and under all ambient conditions. Only then is hygienic and efficient combustion guaranteed. Compact dimensions keep the installation space to a minimum and at the same time provide better accessibility.

ebm-papst offers the world's most extensive product range for condensing technology. From just a few kilowatts for use in private households to several megawatts for supplying entire residential areas: We will always find the right solution. Our portfolio contains efficient EC radial blowers, gas valves and perfectly matched system solutions for every application.

Advantages at a glance

- System and development expertise from the market leader
- Unrivalled power and modulation spectrum
- Well-established technology guarantees a long service life
- High power density thanks to compact design
- Outstanding efficiency levels
- Extremely smooth operation with a low noise level
- Pre-matched components for easy adaptation to the respective application
- Future-proof thanks to BUS connection option

Ideally suited *for all applications*

Residential technology 150 kW

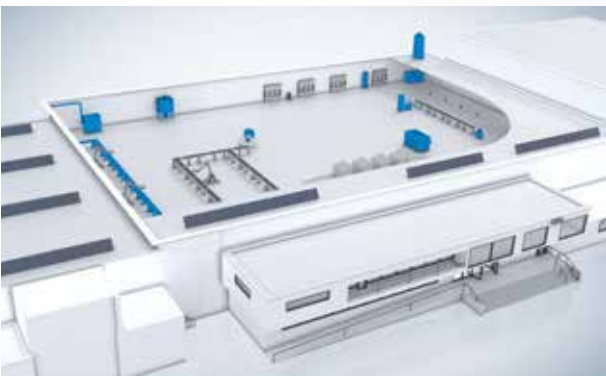


- + Gas condensing heating systems for private households
- + Use as heating unit only, as combi-boiler or in conjunction with regenerative energies

2kw

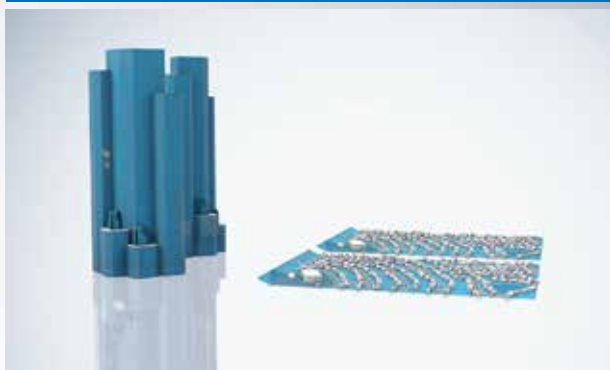


Commercial technology



- + Gas condensing heating systems for applications ranging from small trade businesses to heating installations in large industrial plants
- + From single boiler to cascade system installations

Apartment blocks / residential areas



- + The first condensing blower for heat output up to 4 MW rounds off our extensive product portfolio
- + For decentralized heating solutions keeping construction work and heat loss from long pipes to a minimum compared to large Combined Heat and Power stations



4MW

Laboratory equipment

As market and technology leaders, we are constantly endeavoring to improve our performance and provide our customers with the best possible complete solution. Our engineers and technicians assist our customers with the development of their application right from the start to help advance the process of improvement. Before series launch we conduct extensive tests to ensure compliance with legal requirements and customer specifications. We have a wide range of measuring equipment at our disposal for this purpose.

For example our checks include examining design influences such as modifications to the gas-air mixing device, the backflow flaps or the venturi. All these factors can affect the efficiency, noise level and functionality of a condensing heating system. We take measurements on combustion control systems directly in the heating unit to ensure ideal matching of the individual components and motor performances. This is accompanied by flow simulation with direct incorporation of the results obtained.



+ Gas laboratory:

- Highly advanced measuring equipment with all the standard test and limit gases used in Europe, America and Asia
- Exhaust gas measurements (CO_2 , CO , air ratio), measurements with variable aerodynamic parameters (venturi pressure, mass flow, exhaust gas back pressure) to increase and optimize the modulation range
- Measurement of thermal and electrical performance data
- Simulation of wind and turbulence in the exhaust gas area, e. g. for electronic gas-air composite systems
- Communication with all standard bus systems, e. g. CANbus, LINbus, Modbus, ebus, OpenTherm

+ Climate chambers:

- Environmental simulation and service life tests with more than 30 climatic, cold and warm chambers
- Simulation of temperature range from 70°C to 300°C possible

+ Air performance test stands:

Checking of the operating characteristics of blowers and systems with recording of the air performance curves

+ Endurance test rooms:

About 150 different endurance tests with over 700 specimens in progress

+ Sound measurement laboratory:

Precise sound power and gas measurement technology with incorporation of real conditions

+ Vibration test:

For simulation of transportation and operation with different vibration profiles



+ EMC measurement room:

Emission and immission measurements

+ Approvals:

AGA, CCC, CSA, DVGW, EAC, KIWA, TÜV, UL, VDE

+ Standards and Directives:

- Low-Voltage Directive
- Machinery Directive
- Gas Appliance Regulation
- EMC Directive

+ Additional equipment:

- 3D microscope
- 3D plotter

+ Gas valve test stands:

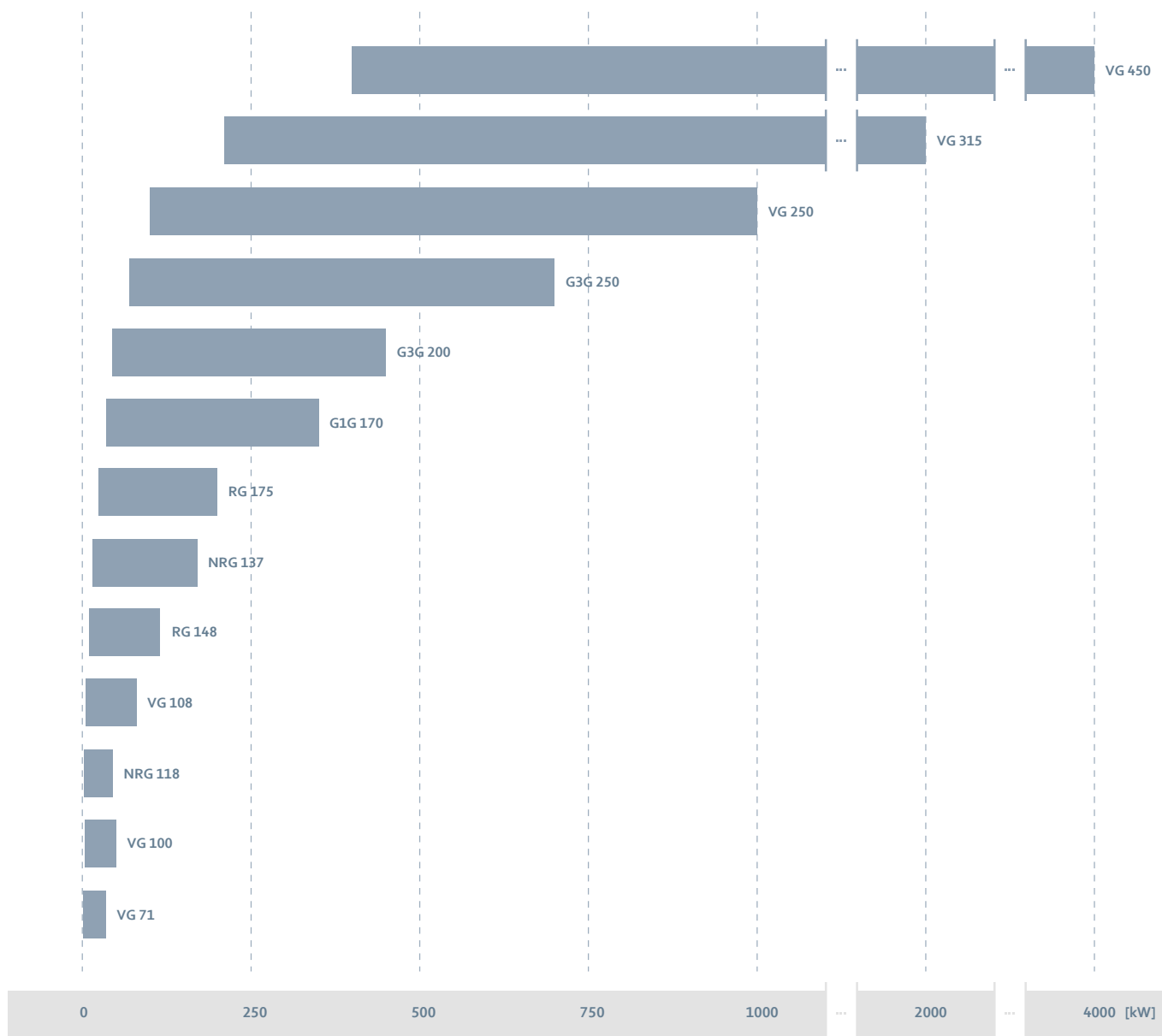
For gas valves with pneumatic and electronic modulation

EC radial blowers

Modern gas-fired modulated condensing units have to be supplied with the optimum volume and mixture of air and fuel in all operating modes and ambient conditions. They require adjustable blowers with steep pressure/air flow characteristic curves and high maximum pressures. ebm-papst played a significant role in developing EC blowers for this purpose and now offers the widest range of

solutions for this application area. The technical data in this catalogue relate to intended use in gas condensing boilers with interior installation. The special features of these blowers also make them suitable for many other applications upon consultation. Examples include gas-powered cooking appliances for the food service industry or gas-powered deep fryers for commercial use.

Heat load in kW



Heat output range depending on type of gas concerned and system conditions.

- + Commutation electronics:**
- Integrated into the blower unit and perfectly harmonized with the motor
 - Integrated blockage switch-off and overheating protection as per EN 60335
 - Various standard interfaces available for the respective burner control
 - Optimized in accordance with EMC emissions and pollution

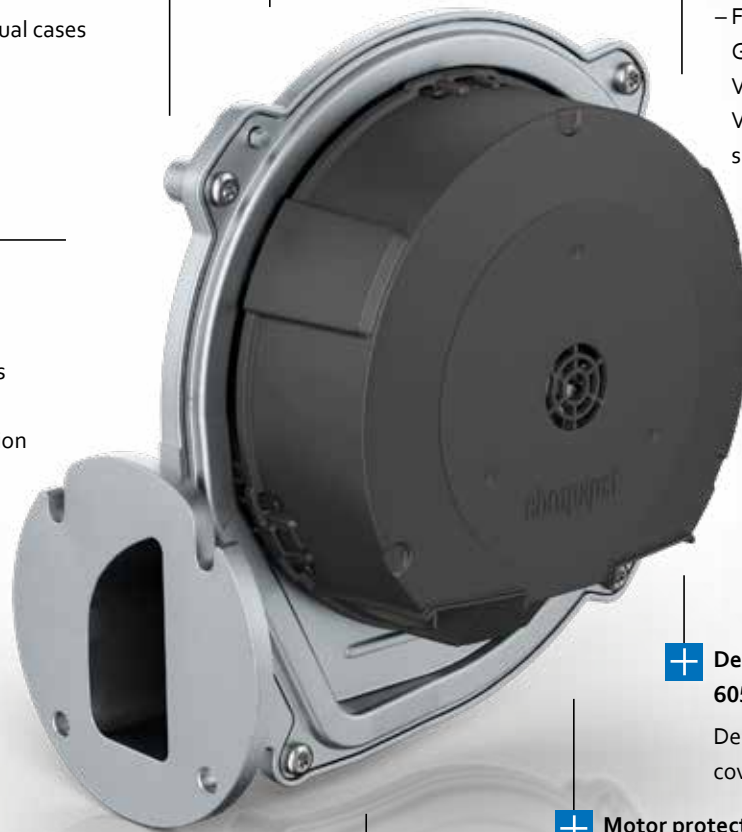
- + Drive:**
- Brushless DC (EC) motors with integrated electronics
 - Vibration-free mounting to minimize structure-borne sound
 - Adjustment of motor power on an individual basis

- + Housing:**
- Made of die-cast aluminum
 - (respectively cast aluminum/sheet steel)
 - Required density thanks to special seal for housing halves and drive shaft conduit
 - Outlet flange adjustable to many designs

- + Impellers:**
- For type VG 71, 100 and 108, NRG and RG blowers of pentane-resistant plastic: dynamically fine balanced
 - For the G1G 170, G3G 200, G3G 250, VG 250, VG 315 and VG 450 models made of sheet aluminum

- + Speed controls:**
- Adjustment required in individual cases
 - Controlled via PWM signal
 - 0-10V input optional
 - Bus communication optional

- + Bearings:**
- Maintenance-free ball bearings covered on both sides for long service life and smooth operation
 - Use of lubricants suited for the particular application



- + Protection class:**
Protection class I

- + Degree of protection DIN EN 60529:2014:**
Degree of protection IP00, with cover hood, as a built-in component

- + Motor protection cap:**
The adjustable rotation of the motor protection cap enables easy accessibility to the plugs and protection against dripping water in the application.

- + Speed output:**
- With Hall IC signal output; in case of motors for line voltage operation, speed signal output is galvanically isolated

- + Mounting positions:**
- With horizontal shaft or vertical shaft with motor positioned at top
 - For vibration-cushioned motor installation, the motor's weight is additionally supported by a flexible element.



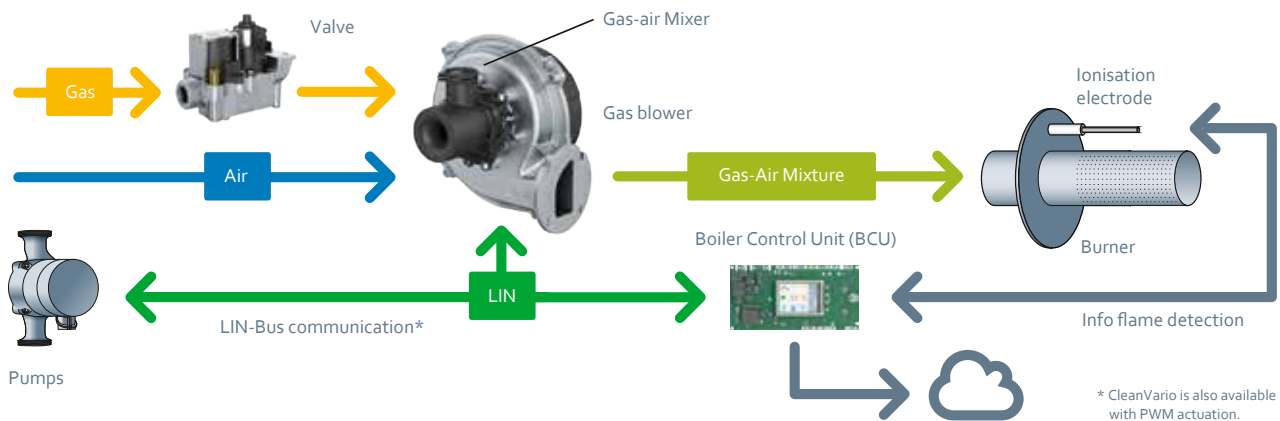
Systems for condensing boiler technology

An optimum gas-air mixing ratio is crucial to the energy yield realized during combustion. The mixing ratio needs to be exactly adjusted to the heating value of the gases being used (e.g. natural gas, LPG or biogas). An additional challenge is the flexibility of heat output. The greater the modulation range of a heating system, the better its heating output can be adjusted to actual needs. The limits of the

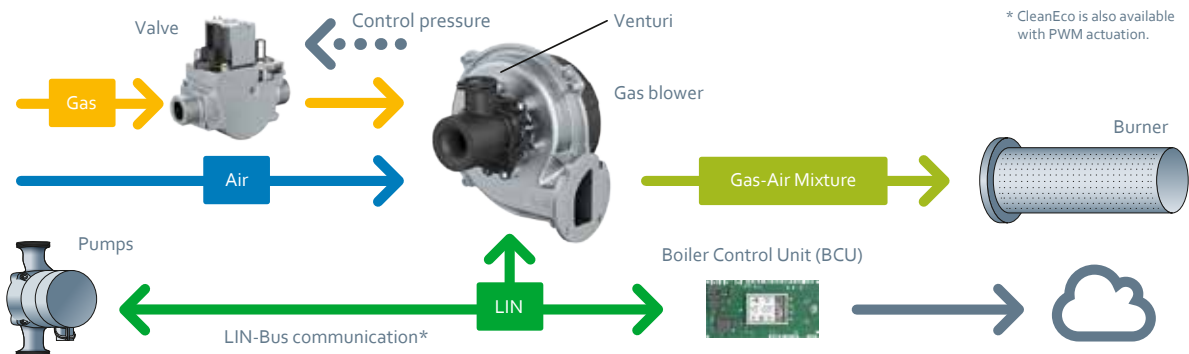
modulation level are determined among others by the minimum and maximum output of the premixing blower. This means its components need to be perfectly matched. That's why we offer complete heating systems including gas blowers, venturics, gas valves and boiler control units from a single source.

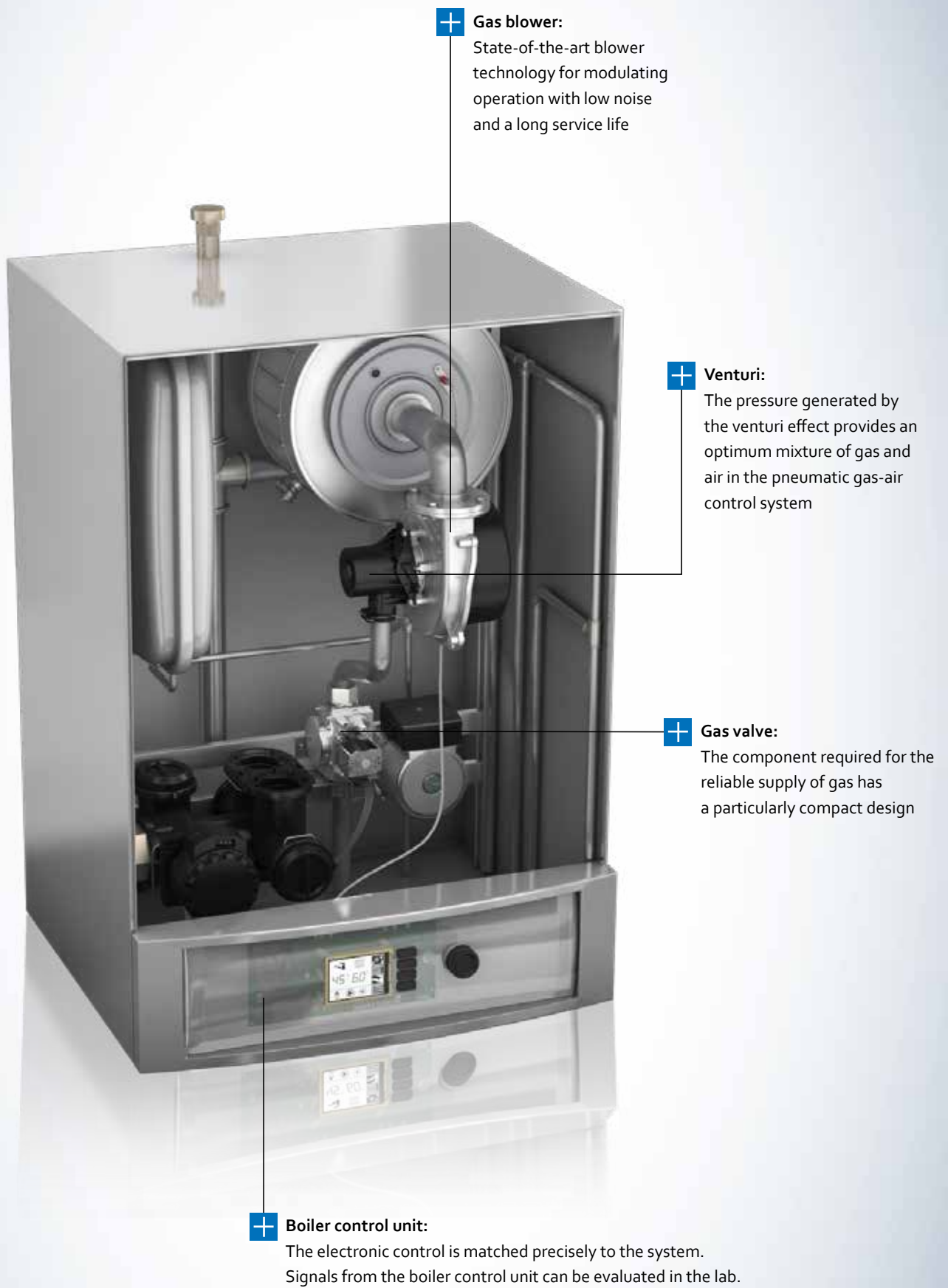
Ideally suited for use in electronic or pneumatic gas-air control systems

CleanVario – electronic gas-air control system



CleanEco – pneumatic gas-air control system





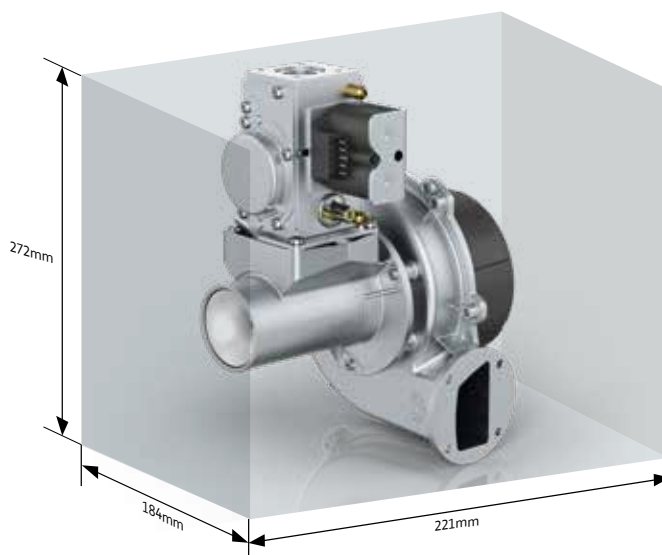
Our system solutions at a glance

All heating technology components must be perfectly harmonized in order to achieve optimum performance and efficiency. This is why we offer complete heating systems, including gas blower, venturi, gas valve and boiler control unit from a single source.

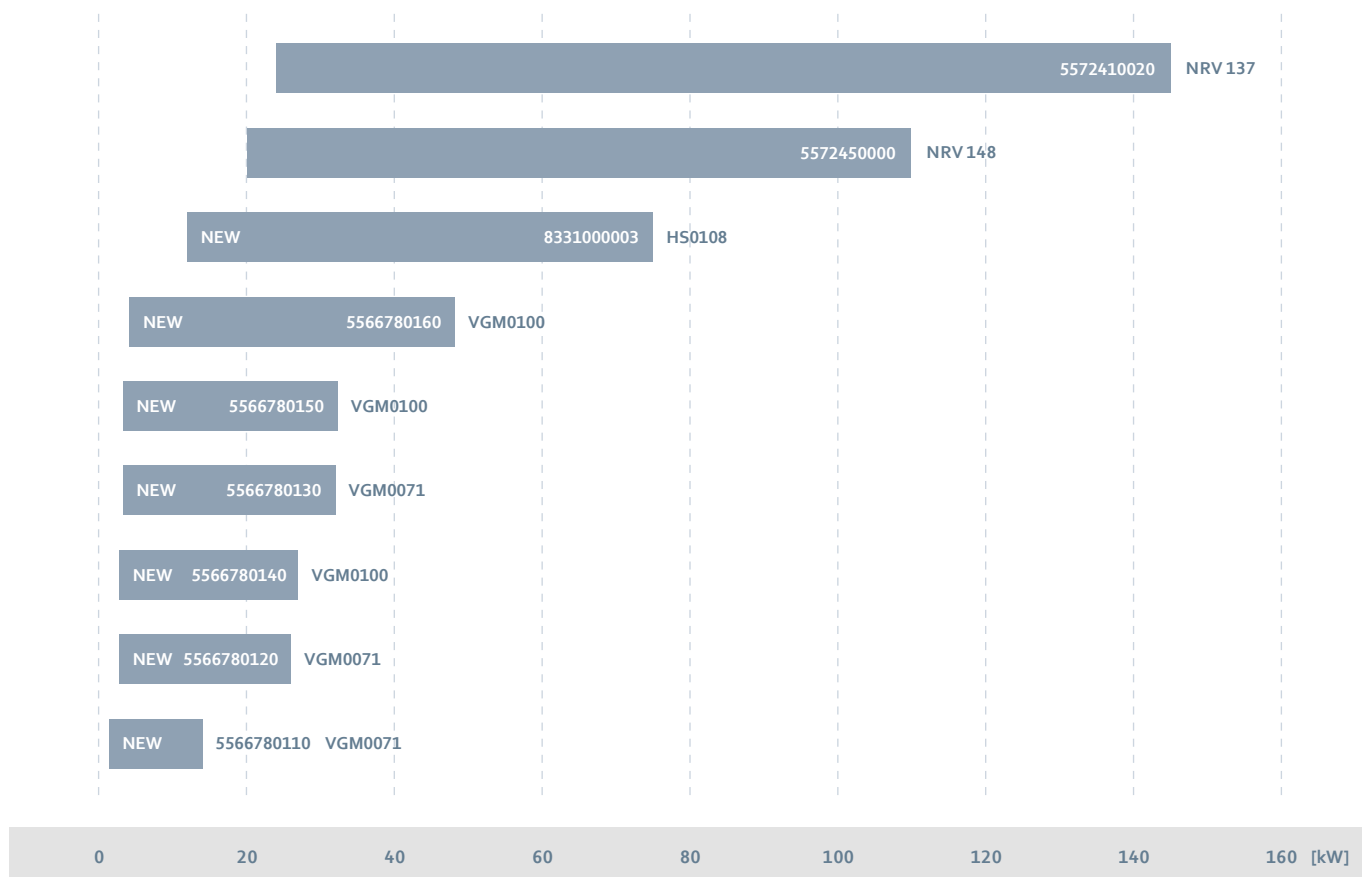
A key benefit of our combustion control systems is their optimal mixing ratio with simultaneously high modulation ranges. To achieve this high level of efficiency, we provide different venturis i.e. high-efficiency venturi or multiventuri, depending on the heat output range.

Our venturi solutions provide you with a wide variety of motor performances and options for assigning our systems to your devices. This gives you the benefit of flexible integration into compact spaces.

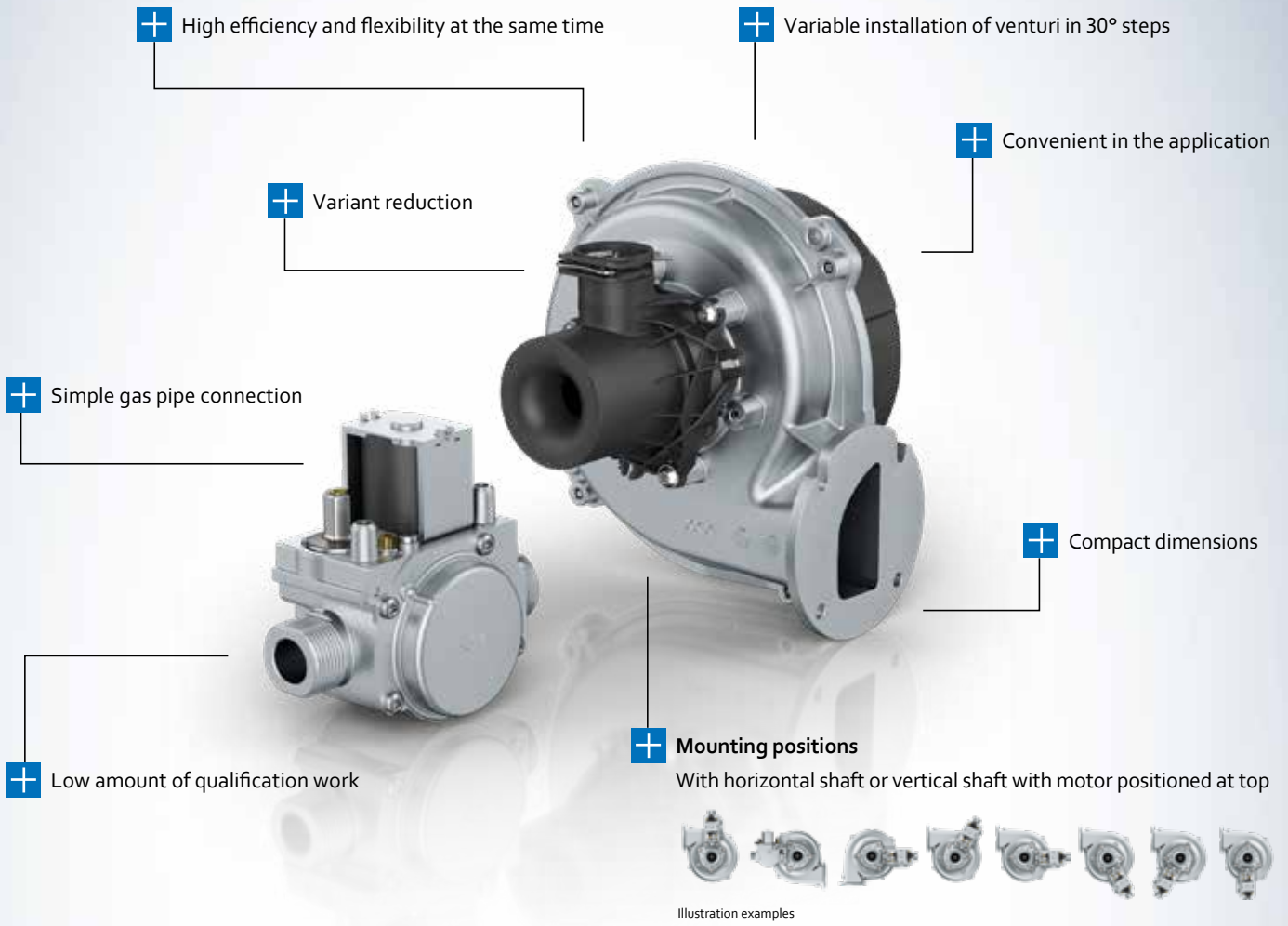
We supply our systems as completely tested, harmonized units with optimized interfaces to minimize your effort.



Heat load in kW



Heat output range depending on type of gas concerned and system conditions. Additional system solutions on request (see page 17).



System solutions

| Heat output range [kW] | System solution | Gas blower | Venturi | Gas valve | Boiler control unit | Part number |
|---------------------------|-----------------|----------------|-------------------------|-----------|---------------------|-------------|
| 1.4 – 14 | VGM0071 | RadiMix VG 71 | High-efficiency venturi | E01 | CleanEco | 5566780110 |
| 3 – 23 | NRV 118 | NRG 118 | Multiventuri | E01 | CleanEco | 5573432010 |
| 2.8 – 26 | VGM0071 | RadiMix VG 71 | High-efficiency venturi | E01 | CleanEco | 5566780120 |
| 2.8 – 27 | VGM0100 | RadiMix VG 100 | High-efficiency venturi | E01 | CleanEco | 5566780140 |
| 5 – 28 | NRV 118 | NRG 118 | Multiventuri | E01 | CleanEco | 5573432020 |
| 3.3 – 32 | VGM0071 | RadiMix VG 71 | High-efficiency venturi | E01 | CleanEco | 5566780130 |
| 3.3 – 32 | VGM0100 | RadiMix VG 100 | High-efficiency venturi | E01 | CleanEco | 5566780150 |
| 7 – 42 | NRV 118 | NRG 118 | Multiventuri | E01 | CleanEco | 5573432030 |
| 4.2 – 48 | VGM0100 | RadiMix VG 100 | High-efficiency venturi | E01 | CleanEco | 5566780160 |
| 12 – 75 | HS0108 | RadiMix VG 108 | Multiventuri | D01 | CleanEco | 8331000003 |
| 20 – 110 | NRV 148 | RG 148 | Multiventuri | D01 | CleanEco | 5572450000 |
| 24 – 145 | NRV 137 | NRG 137 | Multiventuri | D01 | CleanEco | 5572410020 |

Air performance, recommended operating range & heating power modulation

EC radial blower



Air performance curve:

Air performance curves are determined in accordance with DIN ISO 5801, installation type A or C, on a chamber testing platform with outlet side connection.

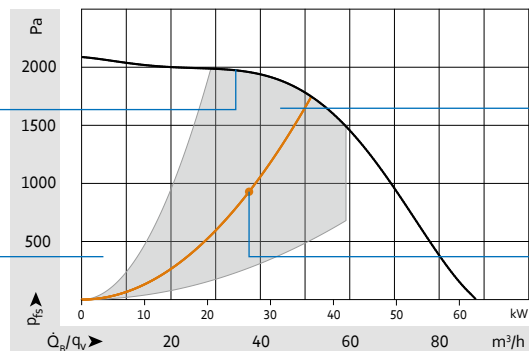
They indicate the pressure increase p_{fs} as a function of the air flow q_v and apply to an air density of $\rho = 1.14 \text{ kg/m}^3 \pm 3.5\%$.

Recommended operating range:



Our gas blowers are developed for operation in the recommended operating range, which is highlighted in gray in the characteristic curve below.

In this range, you will benefit from the blower's maximum overall efficiency and optimized acoustics. The service life is tested in this range. The recommended operating range makes it easier to select the right blower for your application.



Outside the highlighted range in gray, the electronics, motor and parts of the blower that carry air only convert a reduced portion of the electrical input power into usable air performance. The motor and electronics have been optimally designed to comply with strict energy guidelines (ErP2015). Therefore, it is important to operate the blower in the recommended operating range in order to achieve maximum efficiency and minimal noise emissions.

Definitions:

q_v : Air flow rate [m³/h]

\dot{Q}_B : Heat output in [kW]

P_w : Electrical power consumption in [W]

p_{fs} : Pressure increase in [Pa]

The operating point of the blower moves along the system characteristic curve at a variable speed. The mostly quadratic characteristic curve arises from the pressure loss in the system (venturi mixer, intake and exhaust pipe, heat exchanger, burner) at a given air flow rate.



Efficiency and losses of the blower:

System characteristic curve:



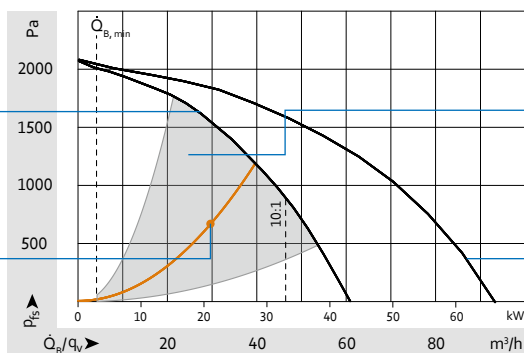
System solution (blower & venturi)

+ Air performance curve: (of the system, consisting of venturi and blower)

The air performance curve indicates the pressure increase p_{fs} of the system (venturi and blower). It is measured in accordance to DIN ISO 5801, installation category A. It indicates the pressure increase p_{fs} as a function of the air flow q_v and applies to an air density of $\rho = 1.14 \text{ kg/m}^3 \pm 3.5\%$.

+ Recommended operating range: (of the system, consisting of venturi and blower)

Our systems, which consists of the high-efficiency venturi and a blower, are optimized to perform in a certain operating range. In this range (highlighted in grey), you will benefit from the system's maximum overall efficiency and a wide modulation range, depending on your additional application pressure losses (intake, burner, heat exchanger, exhaust-pipe).



The operating point of the system (venturi-mixer and blower) moves along the, typically quadratic, system characteristic's curve. Assuming a known gas type e.g. G20, the minimum heat load $\dot{Q}_{B,min}$ for a system is only determined by the venturi-mixer nozzle diameter. Given a minimum venturi pressure of 40Pa for a typical mechanical-pneumatic gas valve, $\dot{Q}_{B,min}$ is stated on page 21.

The maximum heat load is a function of the blower's maximum aerodynamic power and the remaining pressure losses in the application. In this example the remaining system pressure losses are 955Pa at 33kW heat load. Our gas blowers and venturi assembly options offer a high modulation range of the heat load with high efficiency.

The air performance curve of the blower indicates a higher p_{fs} as the pressure losses in the venturi show a nearly quadratic behavior with volume flow q_v . The blower itself is still working in an optimal manner when the venturi is installed and the system is operated as recommended.

+ Operating curve of the application: (\dot{Q}_{min} and modulation)

+ Air performance curve: (blower)

High-efficiency venturi

Gas-air mixing device



Heat output range¹

- Up to 53kW

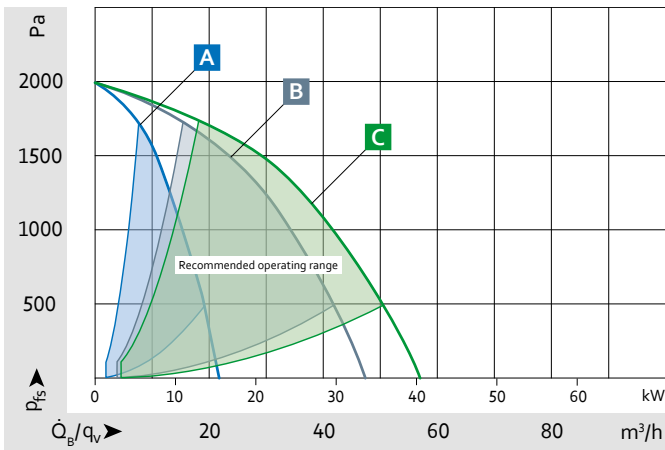
Material/surface

- Plastic

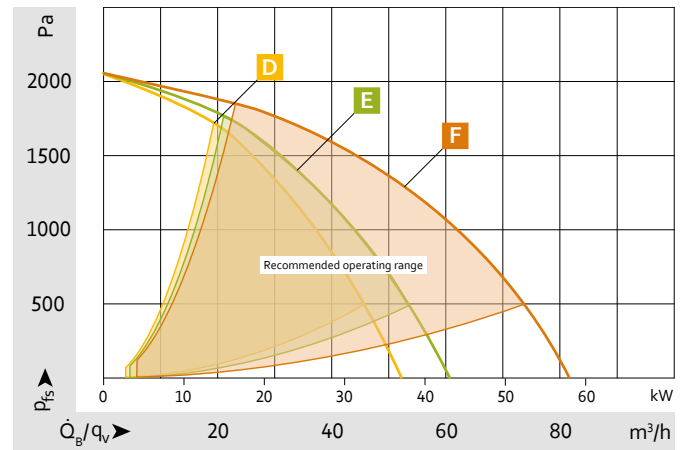
Mechanical data

- Material approval: UL and VDE
- Can be combined with RadiMix VG 71 and RadiMix VG 100
- Depending on the tuning and application pressure losses, modulations up to 1:10 are possible

| | |
|--------------|--|
| on page 21 | Possible mounting positions |
| from page 18 | Air performance and recommended operating ranges |
| from page 48 | Mains connector X, interface connector W |
| from page 50 | Electrical interfaces |
| More at | www.ebmpapst.com |



RadiMix VG 71 with high-efficiency venturi



RadiMix VG 100 with high-efficiency venturi

Measuring requirements

Air performance measured in accordance with ISO 5801, installation category A.
The specifications only apply under the specified measurement conditions
($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.
Heat output \dot{Q}_s for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

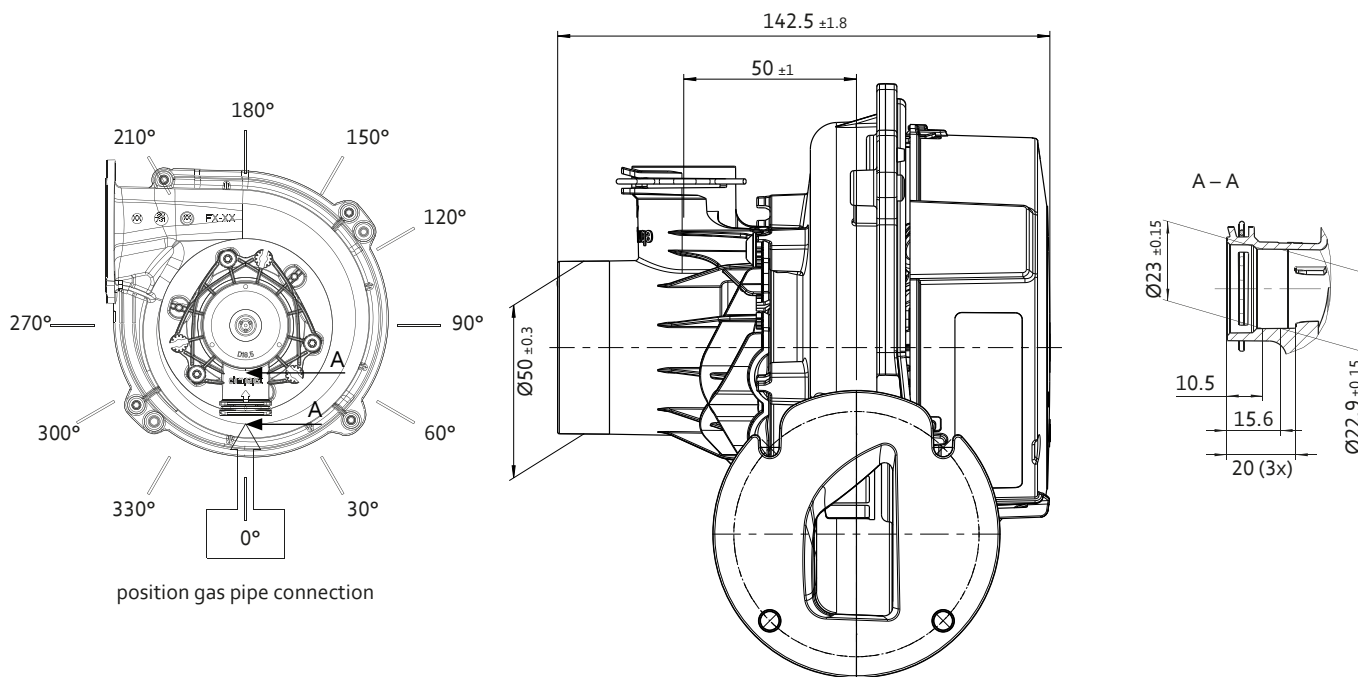
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Venturi nozzle diameter | Minimum heat load $\dot{Q}_{B,min}$ | Heat load at x Pa application pressure loss | Pressure loss application | Weight |
|--|--------------|-------------------|-------------------------|-------------------------------------|---|---------------------------|--------|
| | | | mm | kW | kW | Pa | kg |
| Nominal voltage 220/240VAC, 50/60Hz | | | | | | | |
| <i>RadiMix VG 71 with high-efficiency venturi</i> | | | | | | | |
| A | VGM0071MSGBS | 5566780110 | 10 | 1.4 | 14 | 500 | 1.0 |
| B | VGM0071MSGBS | 5566780120 | 14 | 2.8 | 28 | 750 | 1.0 |
| C | VGM0071MSGBS | 5566780130 | 15.5 | 3.3 | 33 | 825 | 1.0 |
| <i>RadiMix VG 100 with high-efficiency venturi</i> | | | | | | | |
| D | VGM0100MSGBS | 5566780140 | 14 | 2.8 | 28 | 945 | 1.0 |
| E | VGM0100MSGBS | 5566780150 | 15.5 | 3.3 | 33 | 955 | 1.0 |
| F | VGM0100MSGBS | 5566780160 | 18.5 | 4.2 | 42 | 1170 | 1.0 |

Subject to change. Type specifications as system solution consisting of fan and mounted venturi with gas pipe connection position 0°. Other versions on request. Only available in combination with an ebm-papst gas valve. Heat output range depending on type of gas concerned and system conditions.

F Technical drawing

Dimensions in mm



EC radial blower

RadiMix VG 71



Heat output range¹

- Up to 41kW

Material/surface

- Housing: Die-cast aluminum/sheet steel
- Impeller: Plastic
- Motor protection cap: Plastic

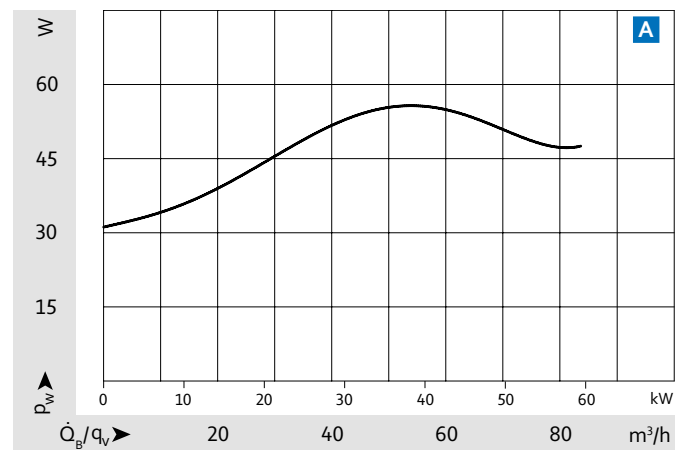
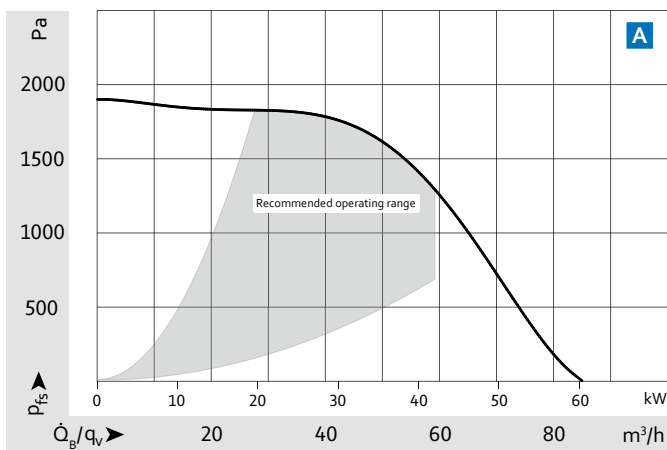
Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- High-efficiency venturi available on request

Electrical data

- Designed for protection class I

| | |
|--------------|--|
| on page 17 | Possible mounting positions and system solutions |
| from page 18 | Air performance and recommended operating ranges |
| from page 48 | Mains connector X, interface connector W |
| from page 50 | Electrical interfaces |
| More at | www.ebmpapst.com |



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.
The specifications only apply under the specified measurement conditions
($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.
Heat output \dot{Q}_s for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

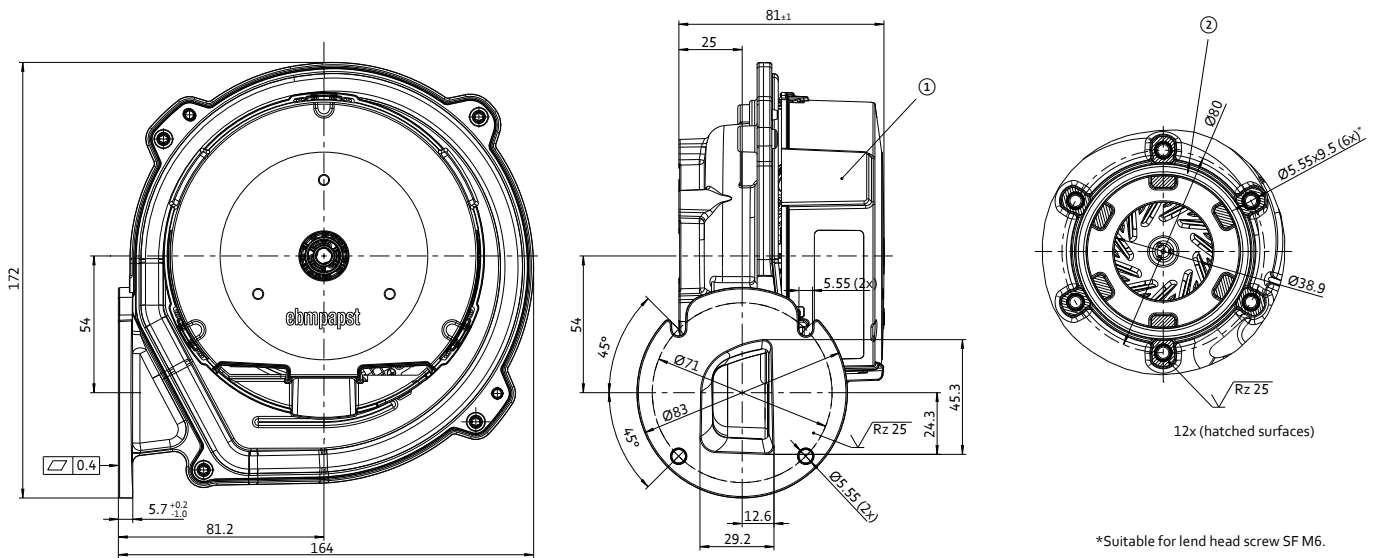
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-------------------------------------|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 220/240VAC, 50/60Hz | | | | | | | |
| A | VGR0071MSGBS | 8331000001 | 14000 | 65 | 0 up to 60 | -15 up to 60 | 0.9 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① no handling on the motor cap permitted
- ② groove suitable for round sealing ring 63x3

EC radial blower

RadiMix VG 100



Heat output range¹

- Up to 57kW

Material/surface

- Housing: Die-cast aluminum/sheet steel
- Impeller: Plastic
- Motor protection cap: Plastic

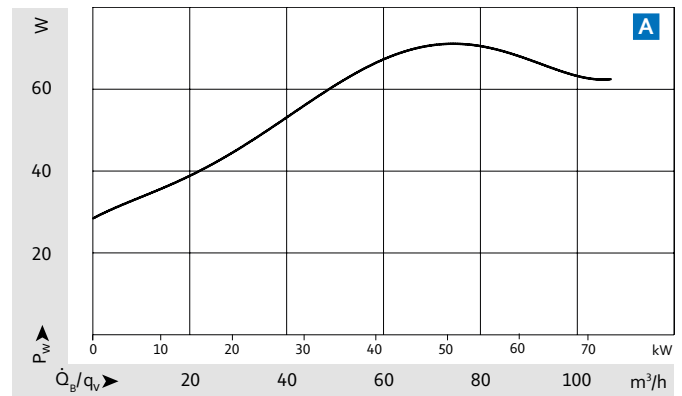
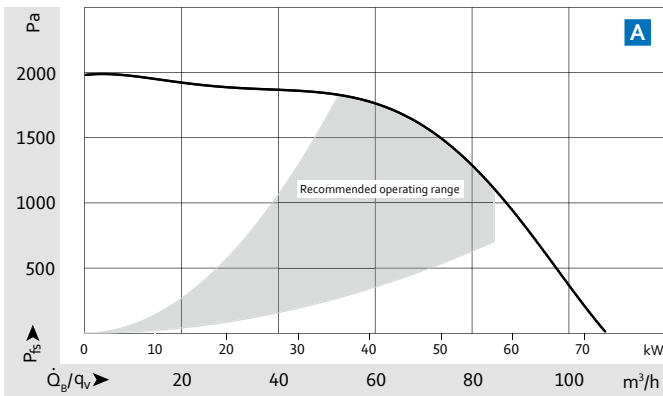
Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- High-efficiency venturi available on request

Electrical data

- Designed for protection class I

| | |
|--------------|--|
| on page 17 | Possible mounting positions and system solutions |
| from page 18 | Air performance and recommended operating ranges |
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| from page 50 | Electrical interfaces |
| More at | www.ebmpapst.com |



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

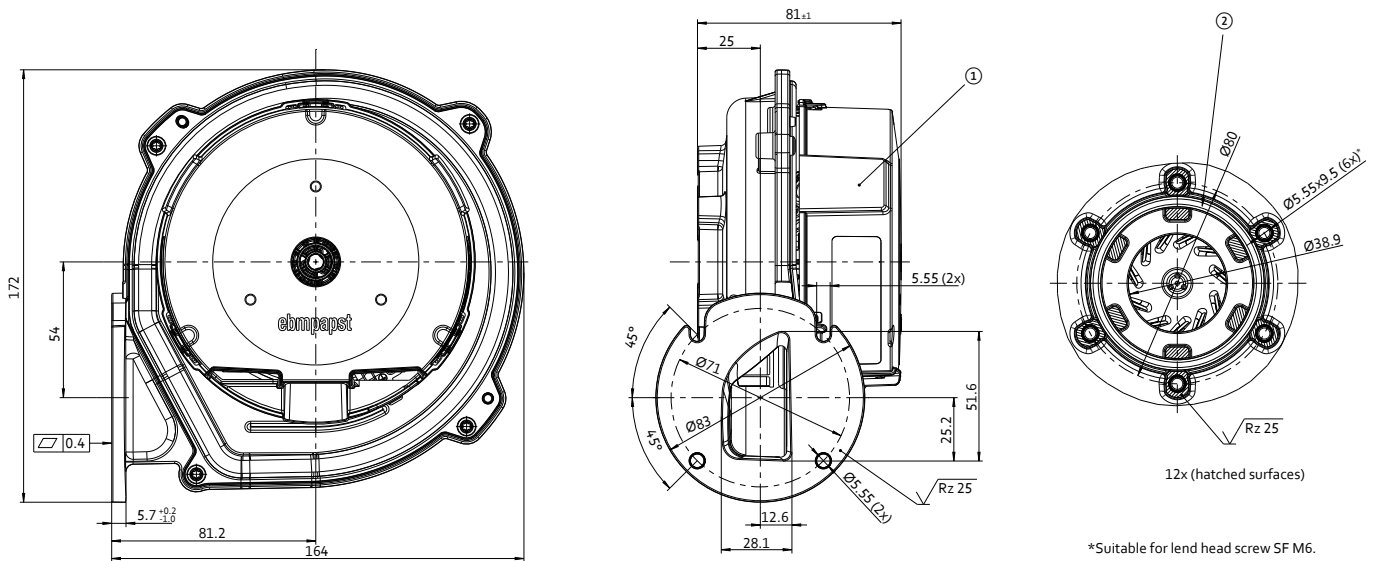
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-------------------------------------|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 220/240VAC, 50/60Hz | | | | | | | |
| A | VGR0100MSGBS | 8331000002 | 10000 | 90 | 0 up to 60 | -15 up to 60 | 0.9 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① no handling on the motor cap permitted
- ② groove suitable for round sealing ring 63x3

*Suitable for lend head screw SF M6.

EC radial blower

RadiMix VG 108



Heat output range¹

- Up to 93kW

Material/surface

- Housing: Die-cast aluminum/sheet steel
- Impeller: Plastic
- Motor protection cap: Plastic

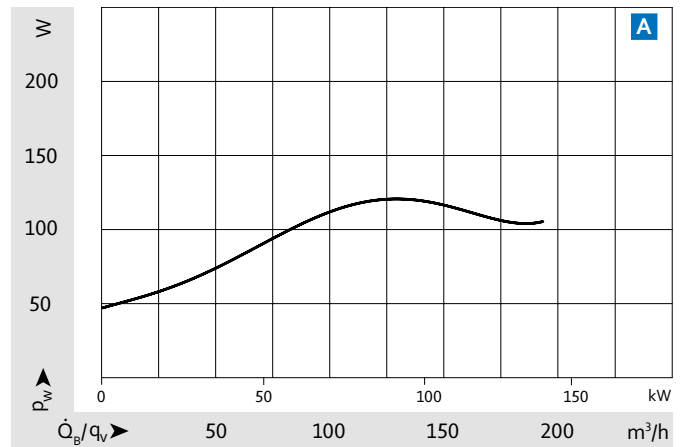
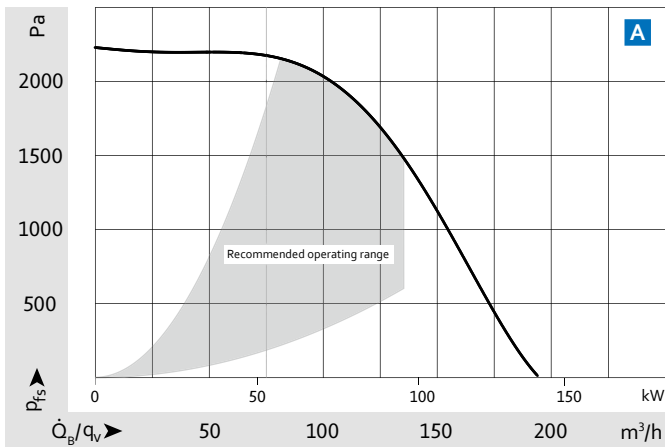
Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- High-efficiency venturi available on request

Electrical data

- Designed for protection class I

| | |
|--------------|--|
| on page 17 | Possible mounting positions and system solutions |
| from page 18 | Air performance and recommended operating ranges |
| from page 48 | Mains connector X, interface connector W |
| from page 50 | Electrical interfaces |
| More at | www.ebmpapst.com |



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.
The specifications only apply under the specified measurement conditions
($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.
Heat output \dot{Q}_s for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

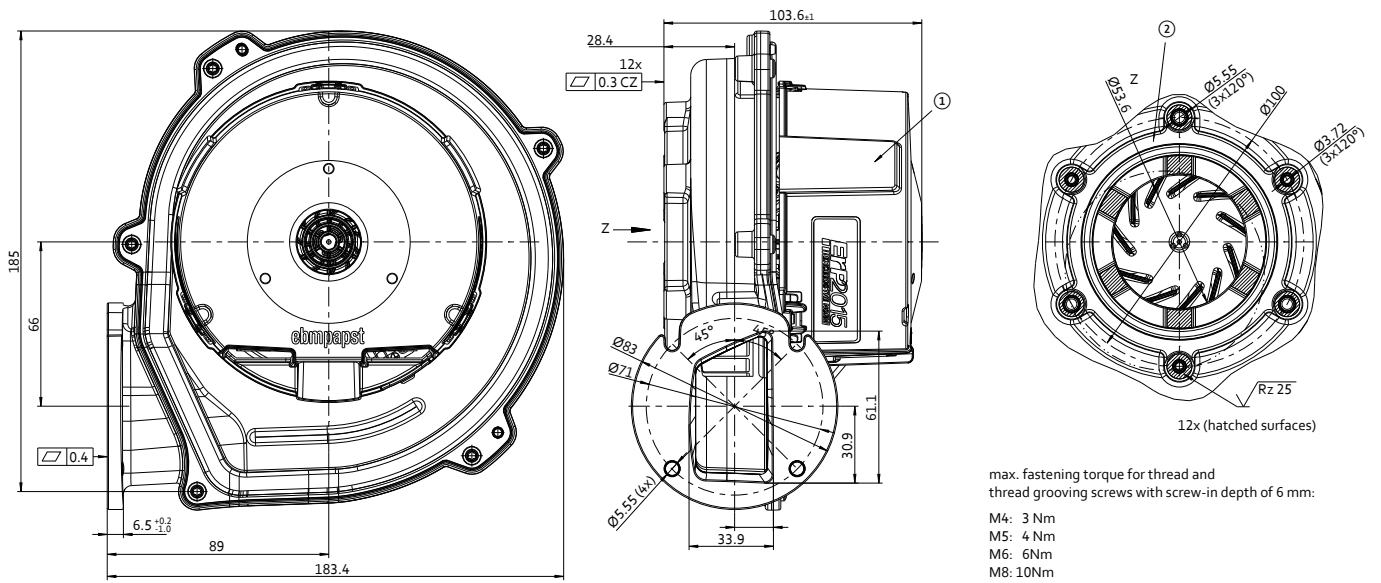
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-------------------------------------|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 220/240VAC, 50/60Hz | | | | | | | |
| A | VGR0108MSGDS | 5566780260 | 10000 | 135 | 0 up to 60 | -15 up to 60 | 1.2 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① no handling on the motor cap permitted
- ② groove suitable for round sealing ring 70x3

EC radial blower

NRG 118



Heat output range¹

- Up to 42kW

Material/surface

- Housing: Aluminum
- Impeller: Plastic
- Motor protection cap: Plastic

Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- Multi-venturi available

Electrical data

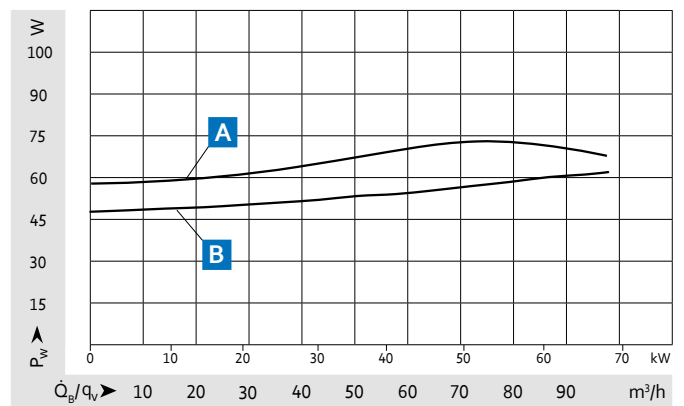
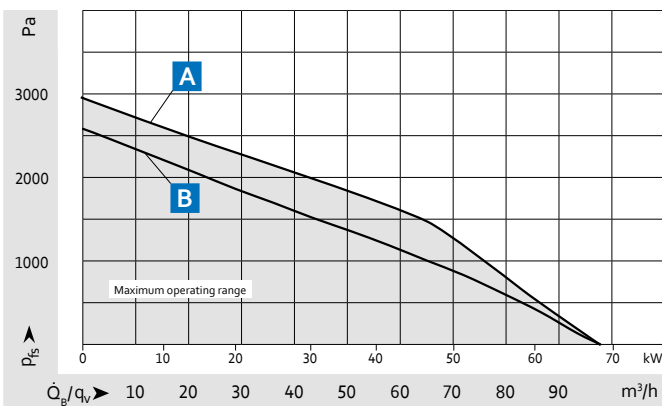
- Designed for protection class I

on page 17 Possible mounting positions and system solutions

from page 48 Mains connector X, interface connector W

from page 50 Electrical interfaces

More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

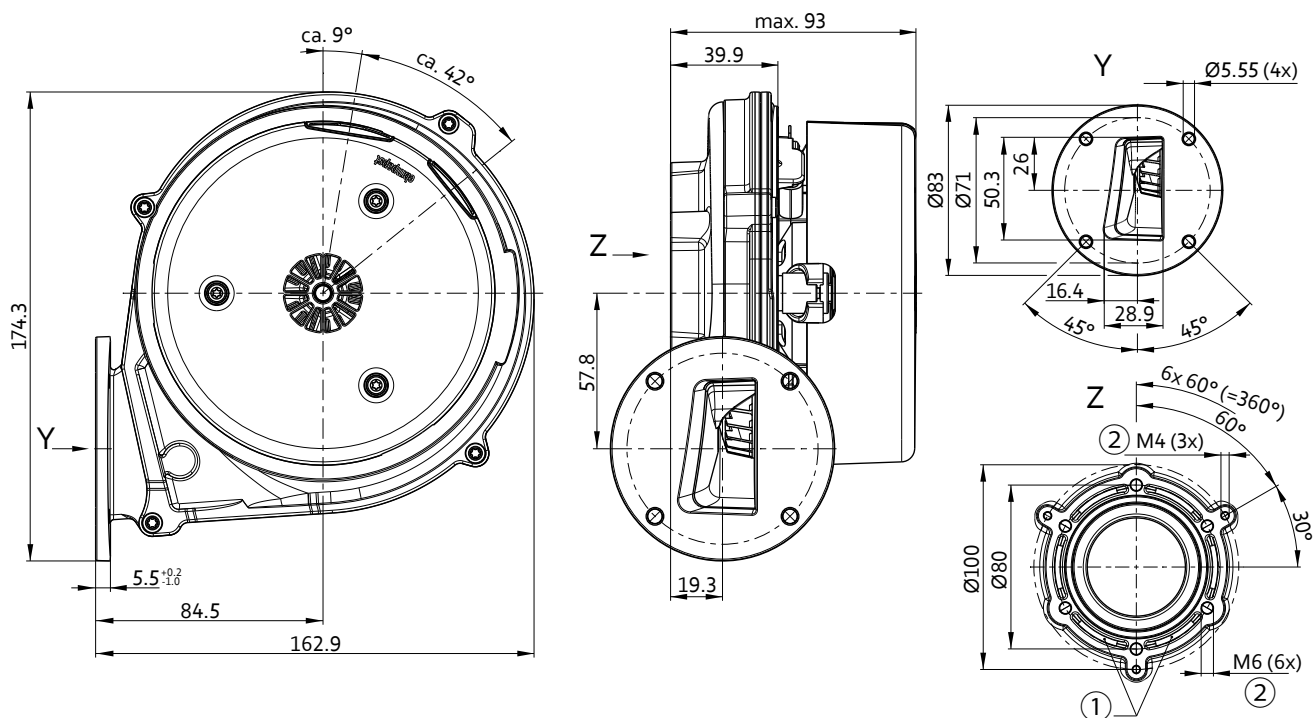
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|------------------------------|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 230VAC, 50Hz | | | | | | | |
| A | VGR0118NSHCS | 5566731160 | 10000 | 70 | 0 up to 60 | -15 up to 60 | 1.0 |
| Nominal voltage 115VAC, 60Hz | | | | | | | |
| B | VGR0118NSHCS | 5566730030 | 10000 | 61 | 0 up to 60 | -15 up to 60 | 1.0 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request. Available with the option of a more powerful motor.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 63 x 3
- ② 6.5 deep

EC radial blower

RG 148



Heat output range¹

- Up to 110kW

Material/surface

- Housing: Aluminum
- Impeller: Plastic
- Motor protection cap: Plastic

Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- Multi-venturi available

Electrical data

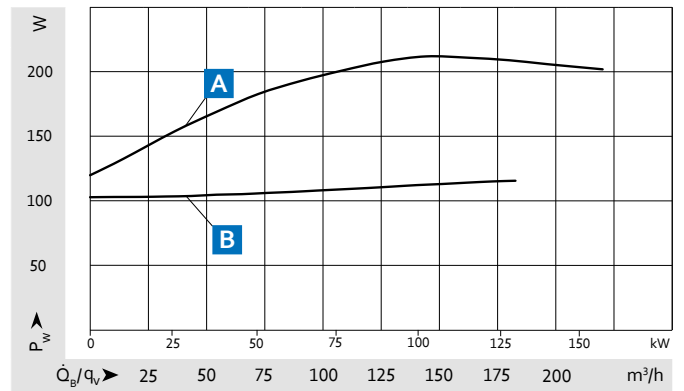
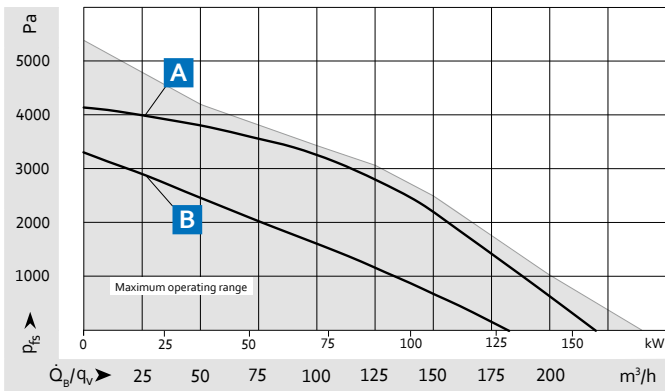
- Designed for protection class I

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More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($p=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

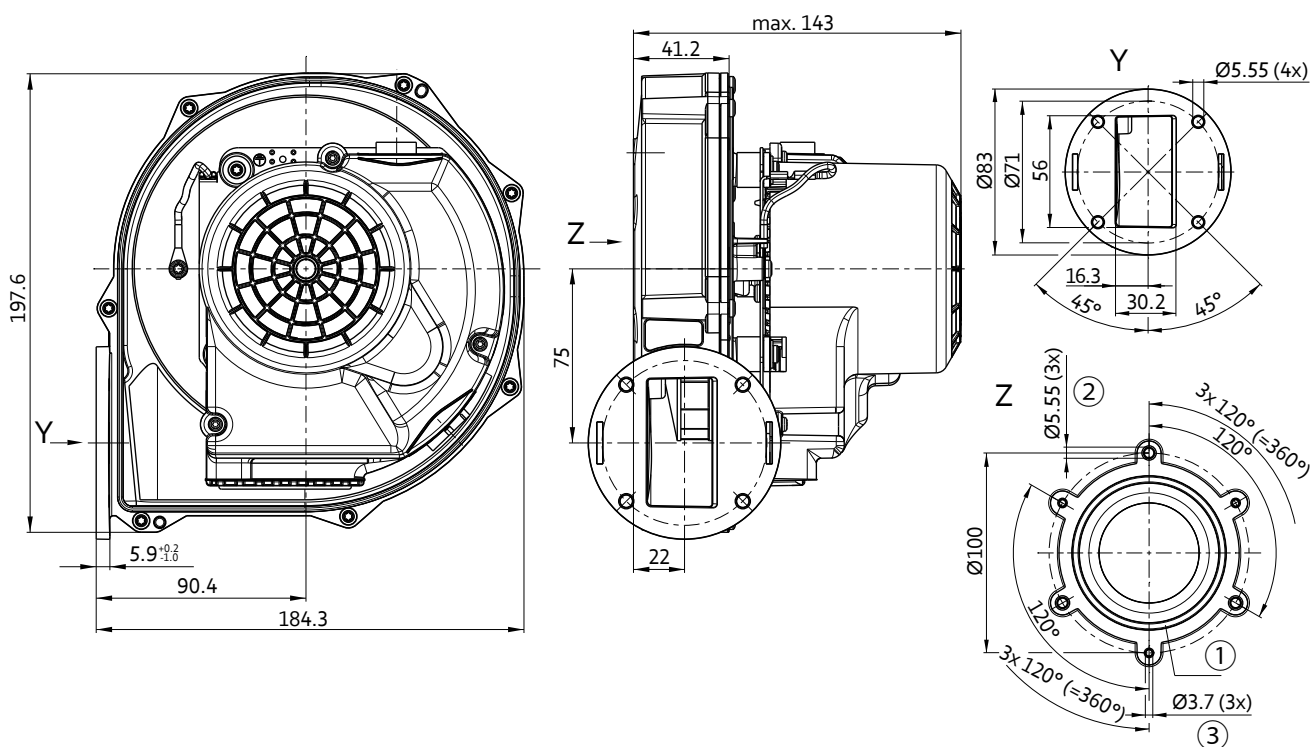
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---------------------------------|--------------|-------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 230VAC, 50/60Hz | | | | | | | |
| A | VGR0148XSHGS | 5566725230 | 9000 | 200 | 0 up to 60 | -15 up to 60 | 2.1 |
| Nominal voltage 120VAC, 60Hz | | | | | | | |
| B | VGR0148XSHGS | on request | 8200 | 130 | 0 up to 60 | -15 up to 60 | 2.0 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request. Available with the option of a more powerful motor.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 70 x 3
- ② 10.5 deep
- ③ 9.5 deep

EC radial blower

NRG 137



Heat output range¹

- Up to 150kW

Material/surface

- Housing: Aluminum
- Impeller: Plastic
- Motor protection cap: Plastic

Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings
- Multi-venturi available

Electrical data

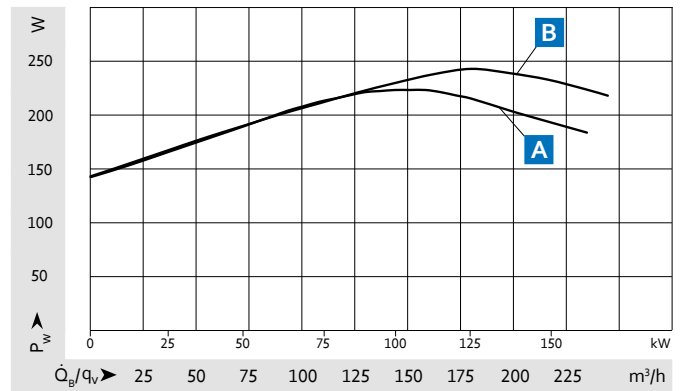
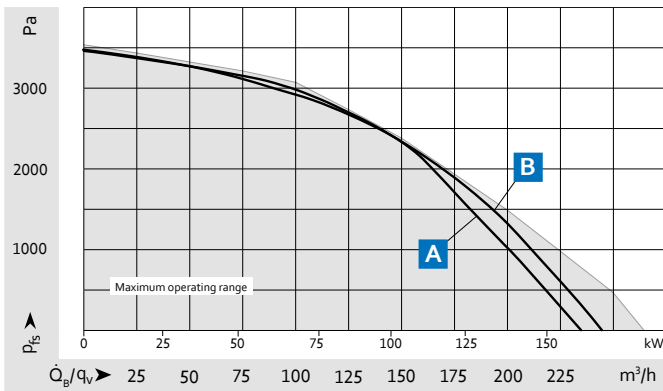
- Designed for protection class I

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More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

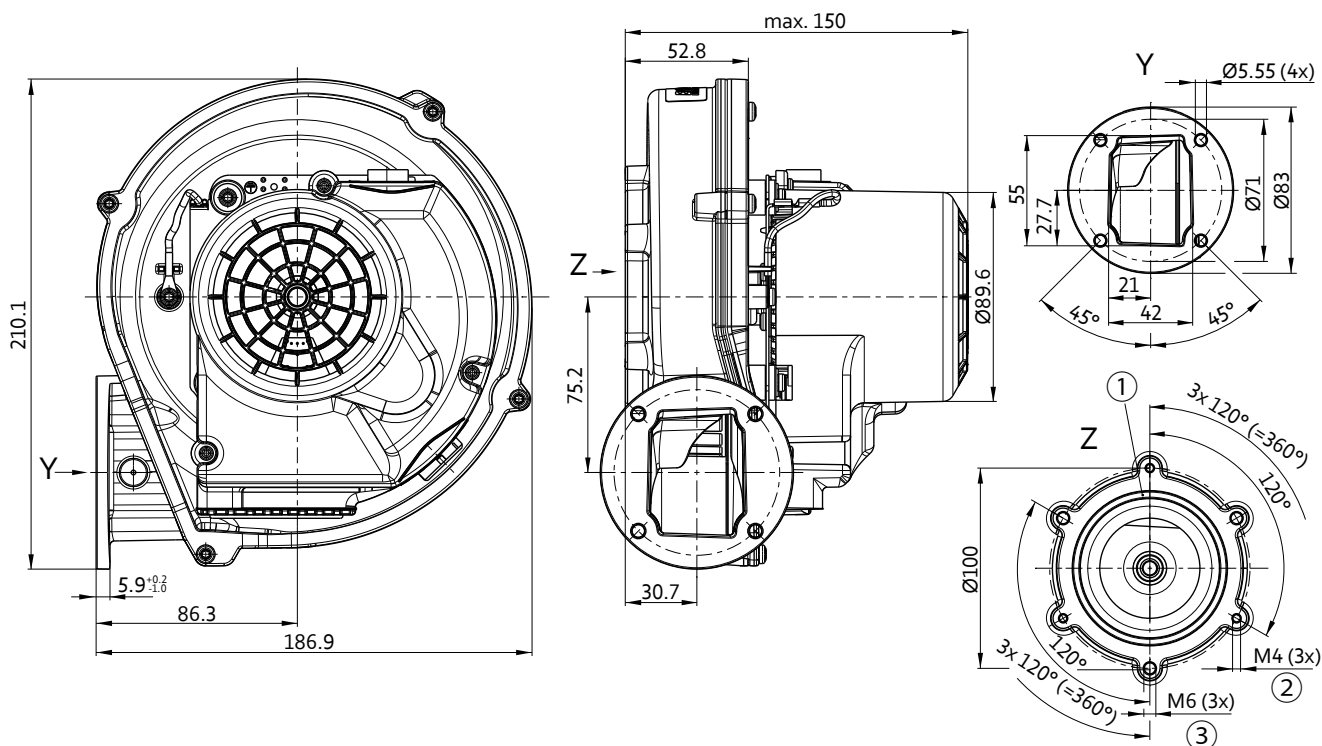
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---------------------------------|--------------|-------------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 230VAC, 50/60Hz | | | | | | | |
| A | VGR0137NSHGS | 5566733110 | 8500 | 220 | 0 up to 60 | -15 up to 60 | 1.9 |
| Nominal voltage 120VAC, 60Hz | | | | | | | |
| B | VGR0137NSHGS | 5566733040 | 8500 | 250 | 0 up to 60 | -15 up to 60 | 2.4 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request. Available with the option of a more powerful motor.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 70 x 3
- ② 6.5 deep
- ③ 7.5 deep

EC radial blower

RG 175



Heat output range¹

- Up to 200kW

Material/surface

- Housing: Aluminum
- Impeller: Plastic
- Motor protection cap: Plastic

Mechanical data

- Degree of protection: IP00, with cover hood, as a built-in component
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings

Electrical data

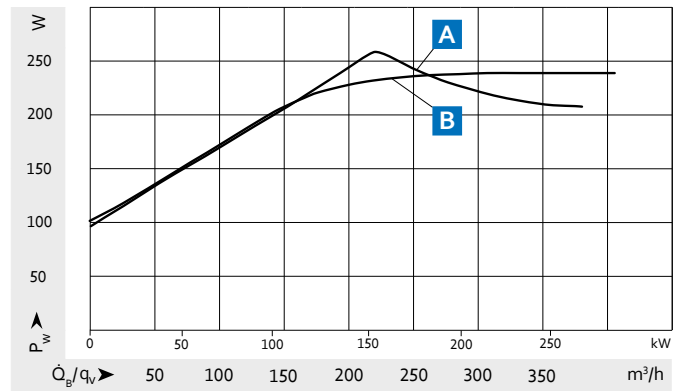
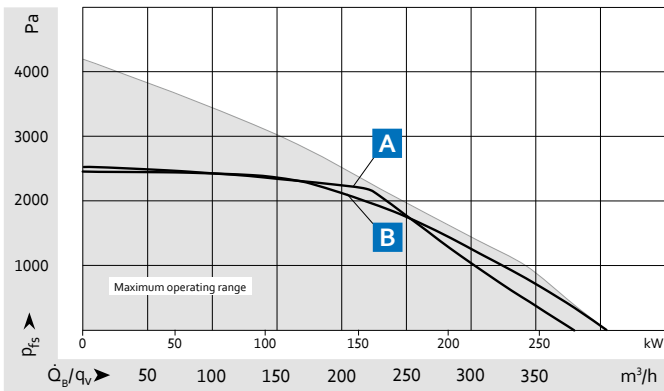
- Designed for protection class I

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More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($p=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

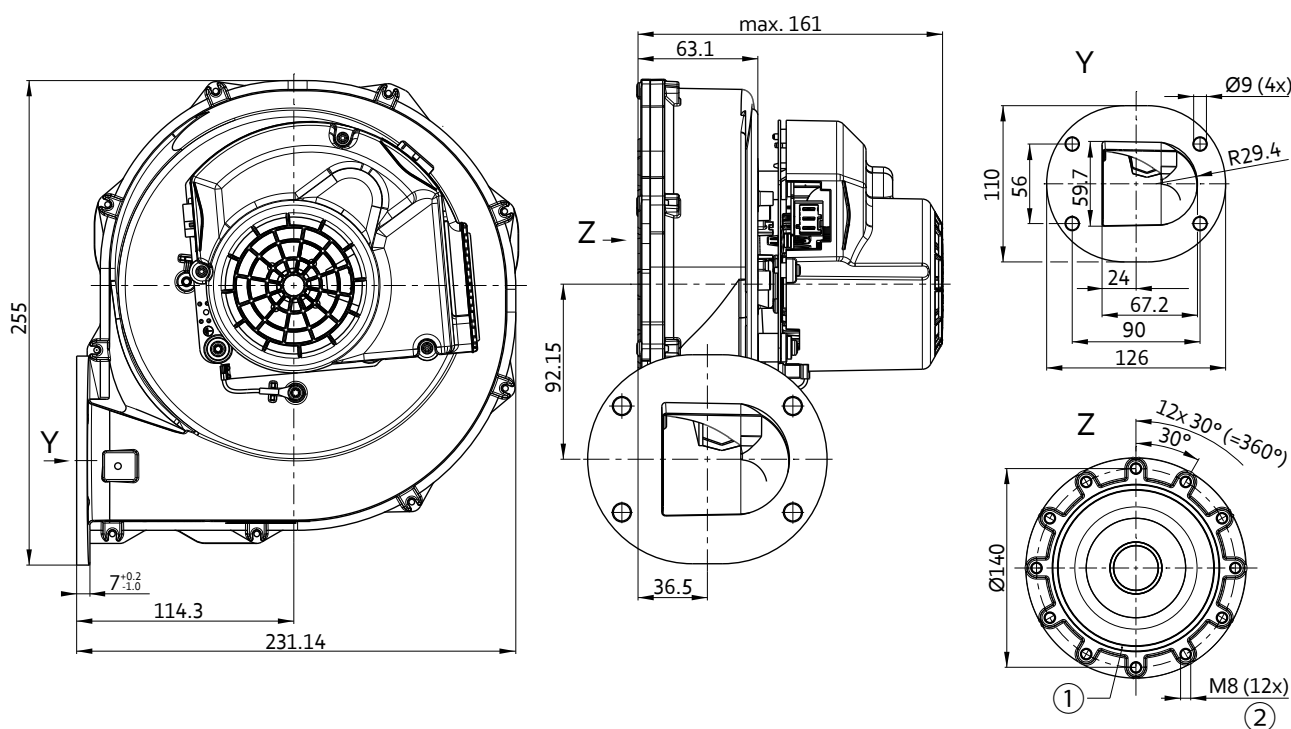
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---------------------------------|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 230VAC, 50/60Hz | | | | | | | |
| A | VGR0175XSHGS | 5566714090 | 6250 | 270 | 0 up to 60 | -15 up to 60 | 2.9 |
| Nominal voltage 120VAC, 60Hz | | | | | | | |
| B | VGR0175XSHGS | 5566714002 | 6250 | 240 | 0 up to 60 | -15 up to 60 | 2.8 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request. Available with the option of a more powerful motor.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 110 x 3.4
- ② 8.5 deep

EC radial blower

G1G 170



Heat output range¹

- Up to 300kW

Material/surface

- Housing: Aluminum
- Impeller: Sheet aluminum
- Motor protection cap: Plastic

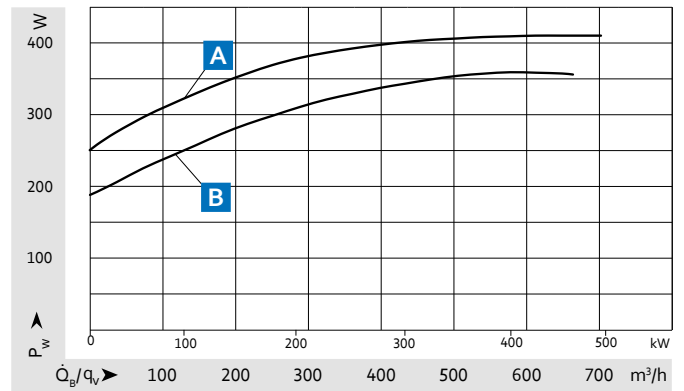
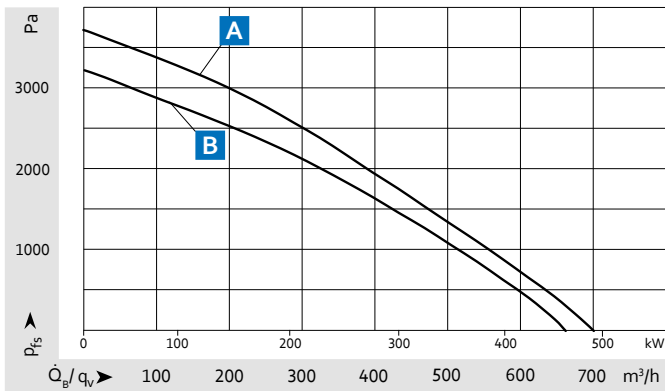
Mechanical data

- Degree of protection: IP20 with cover hood
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings

Electrical data

- Designed for protection class I

| | |
|--------------|--|
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Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

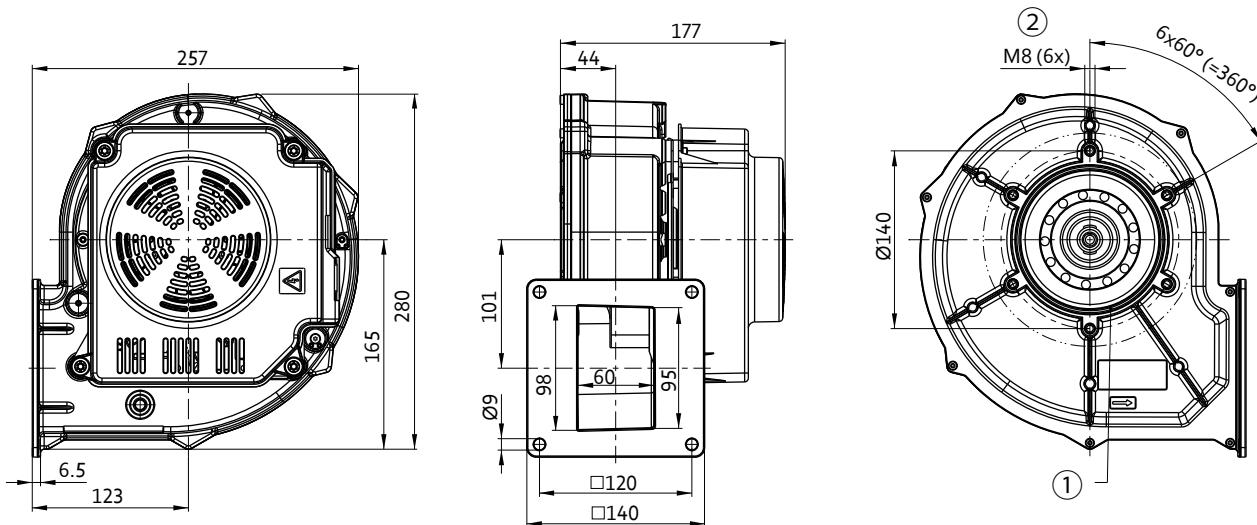
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-----------------------------------|--------------|-------------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 1~230VAC, 50/60Hz | | | | | | | |
| A | VGR0170XSPGS | 5560001182 | 7200 | 420 | 0 up to 55 | -15 up to 55 | 5.0 |
| Nominal voltage 1~115VAC, 50/60Hz | | | | | | | |
| B | VGR0170XSPGS | 5560001011 | 7200 | 360 | 0 up to 55 | -15 up to 55 | 5.0 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 110 x 3.2
- ② 9.5 deep

EC radial blower

G3G 200



Heat output range¹

- Up to 500kW

Material/surface

- Housing: Aluminum
- Impeller: Sheet aluminum
- Motor protection cap: Plastic

Mechanical data

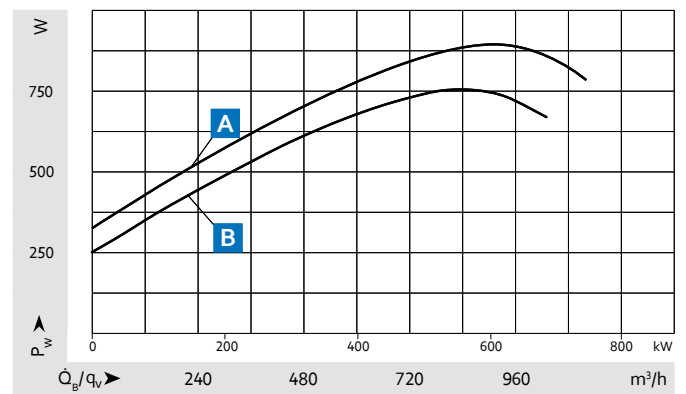
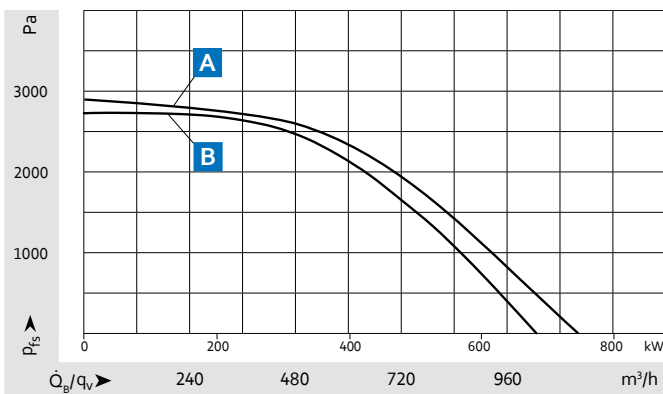
- Degree of protection: IP20 with cover hood
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings

Electrical data

- Designed for protection class I

| | |
|--------------|--|
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| More at | www.ebmpapst.com |

EC radial blowers



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($p=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

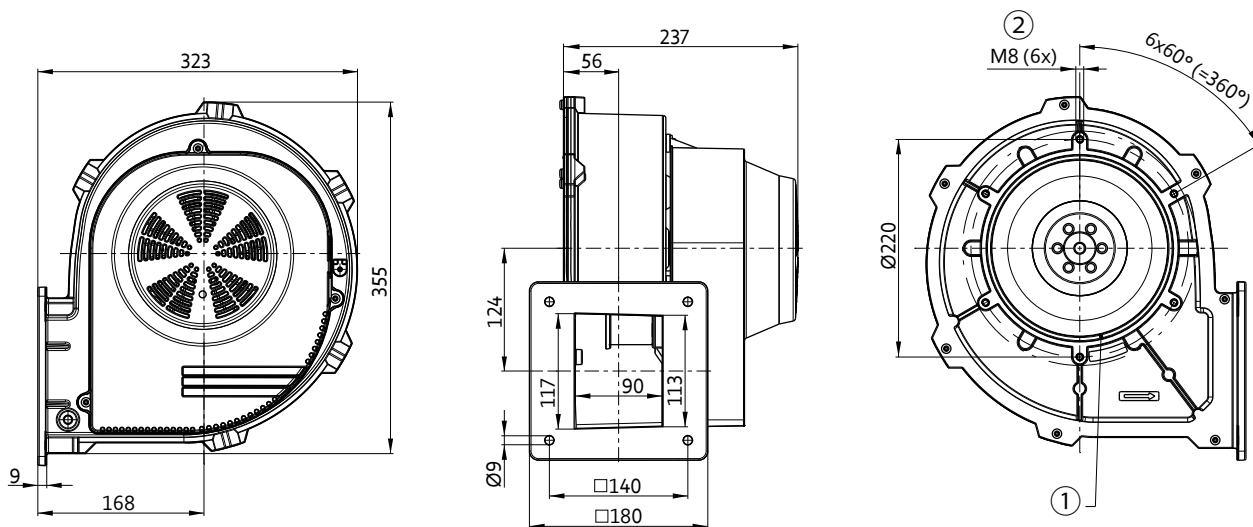
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-----------------------------------|--------------|-------------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 1~230VAC, 50/60Hz | | | | | | | |
| A | VGR0200XSPKS | 5560003030 | 6100 | 890 | 0 up to 50 | -15 up to 50 | 10 |
| Nominal voltage 1~115VAC, 50/60Hz | | | | | | | |
| B | VGR0200XSPKS | 5560003051 | 5700 | 800 | 0 up to 60 | -15 up to 60 | 10 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 180 x 3.5
- ② 12 deep

EC radial blower

G3G 250



Heat output range¹

- Up to 800kW

Material/surface

- Housing: Aluminum
- Impeller: Metal
- Motor protection cap: Plastic

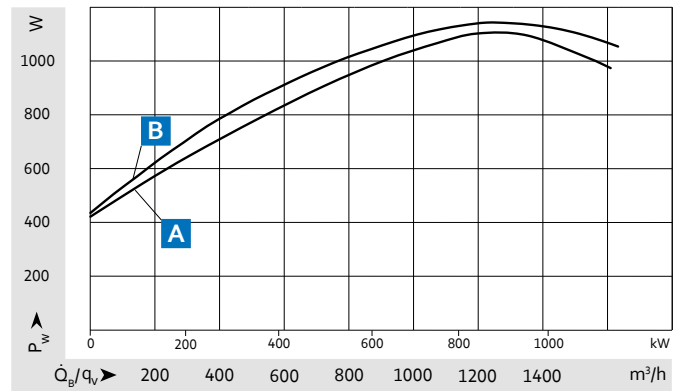
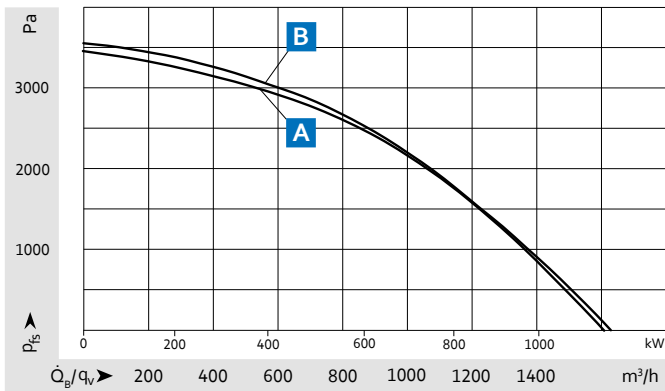
Mechanical data

- Degree of protection: IP20 with cover hood
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings

Electrical data

- Designed for protection class I

| | |
|--------------|--|
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| More at | www.ebmpapst.com |



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($p=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

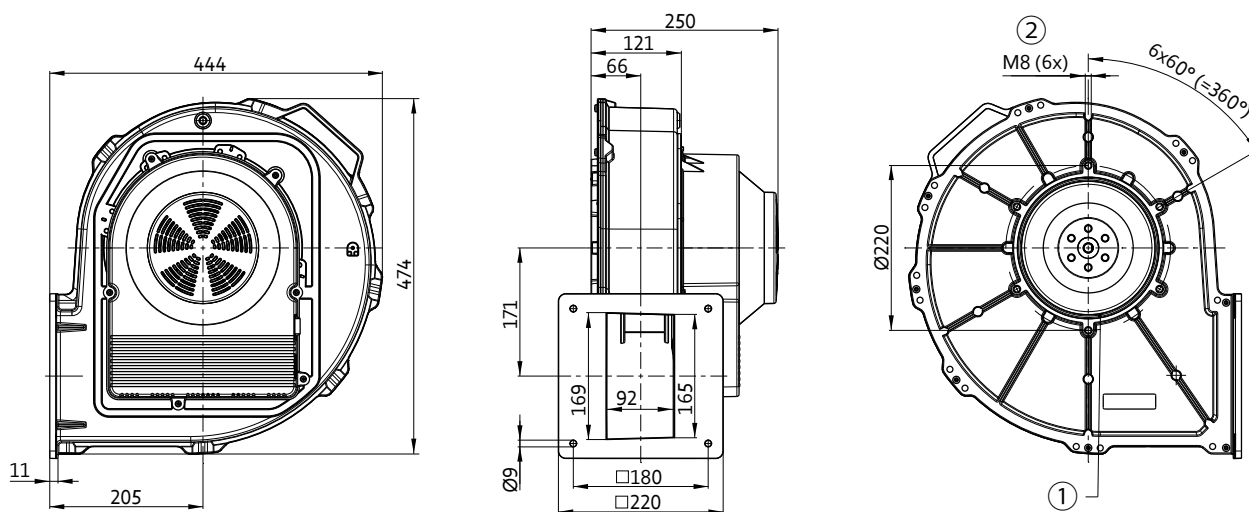
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|-----------------------------------|--------------|-------------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 1~230VAC, 50/60Hz | | | | | | | |
| A | VGR0250XSPKS | 5560005021 | 5200 | 1150 | 0 up to 60 | -15 up to 60 | 13 |
| Nominal voltage 1~115VAC, 50/60Hz | | | | | | | |
| B | VGR0250XSPKS | 5560005051 | 5200 | 1200 | 0 up to 60 | -15 up to 60 | 13 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① Groove suitable for round sealing ring 180 x 3.5
- ② 12 deep

EC radial blower

VG 250



Heat output range¹

- Up to 1100kW

Material/surface

- Housing: Aluminum
- Impeller: Sheet aluminum
- Motor housing: Metal

Mechanical data

- Degree of protection: IP20 with cover hood
- Installation position: With horizontal shaft or for vertical shaft with motor position above
- Bearing: Ball bearings

Electrical data

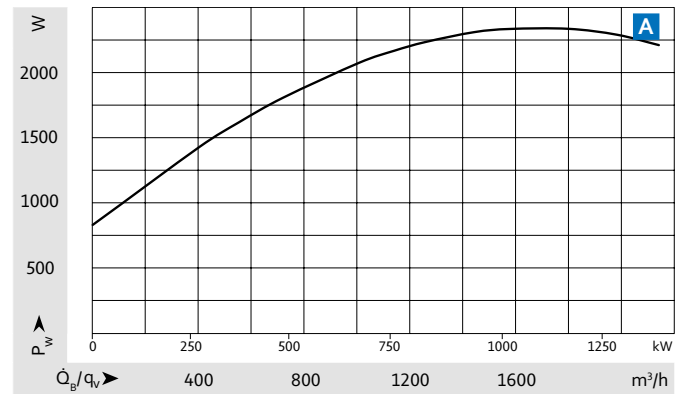
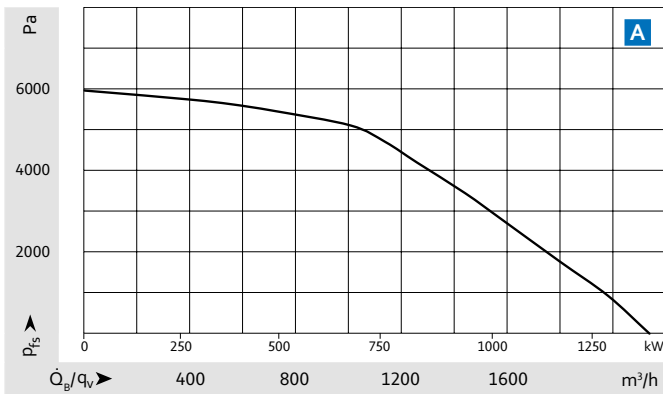
- Designed for protection class I

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More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

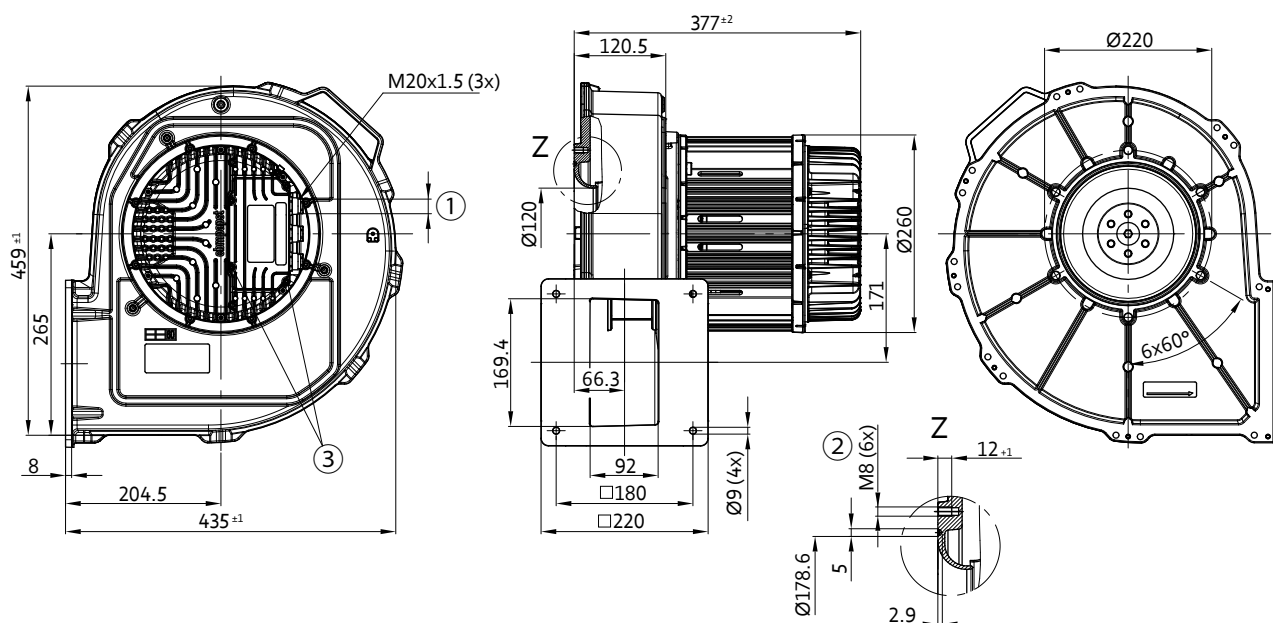
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P_{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---|--------------|-------------|--------------|---------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 3-380 – 480VAC, 50/60Hz | | | | | | | |
| A | VGR0250XTRHS | 5560006010 | 6400 | 2500 | 0 up to 50 | -15 up to 50 | 24 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



- ① Cable diameter min. 4 mm, max. 10 mm, tightening torque 4 ± 0.6 Nm
- ② Clearance for screw 10-12 mm, tightening torque 20 ± 3 Nm
- ③ Tightening torque 3.5 ± 0.5 Nm

EC radial blower

VG 315



Heat output range¹

- Up to 2000kW

Material/surface

- Housing: Aluminum
- Impeller: Sheet aluminum
- Motor protection cap: Plastic

Mechanical data

- Degree of protection: IP20 with cover hood
- Installation position: Any
- Bearing: Ball bearings

Electrical data

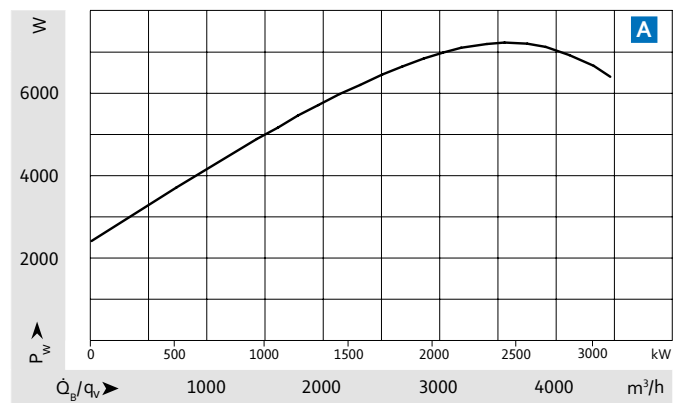
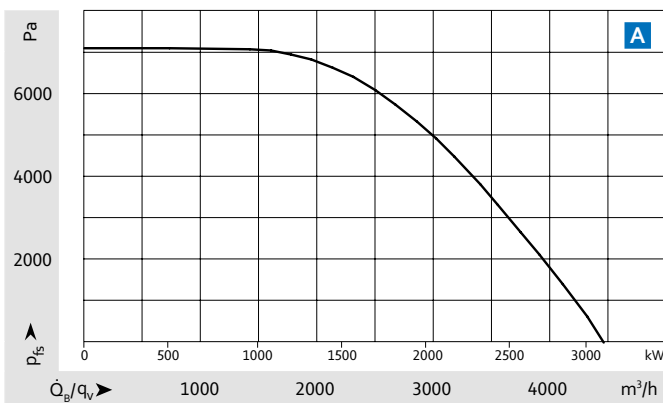
- Designed for protection class I

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More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

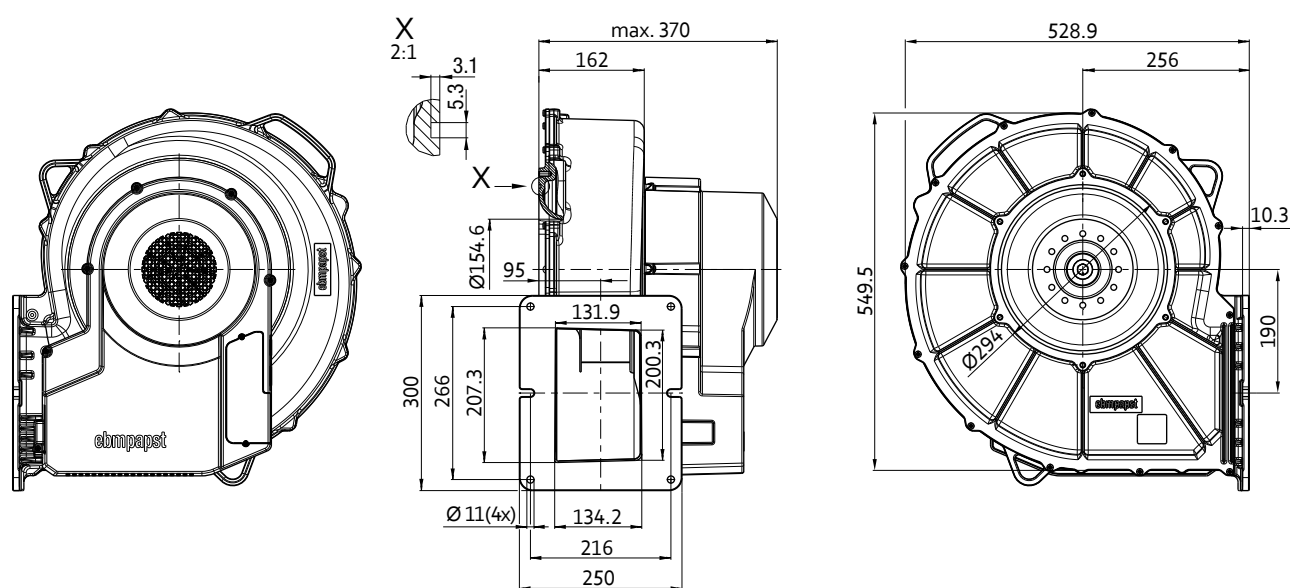
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---|--------------|--------------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 3-380 – 480VAC, 50/60Hz | | | | | | | |
| A | VGR0315XTTLS | 5560007000* | 6000 | 8000 | 0 up to 60 | -15 up to 60 | 36 |
| Nominal voltage 3-200 – 240VAC, 50/60Hz | | | | | | | |
| | VGR0315XTTLS | 5560007030 | 6000 | 8000 | 0 up to 50 | -15 up to 60 | 36 |

Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request. * Also available with 0 – 10V interface.

A Technical drawing

Dimensions in mm



EC radial blower

VG 450



Heat output range¹

- Up to 4000kW

Material/surface

- Housing: Cast aluminum
- Impeller: Sheet aluminum
- Motor casing: Die-cast aluminum
- Electronics box: Die-cast aluminum

Mechanical data

- Protection class electronics: IP54
- Protection class motor: IP20
- Installation position: Any
- Bearing: Ball bearings

Electrical data

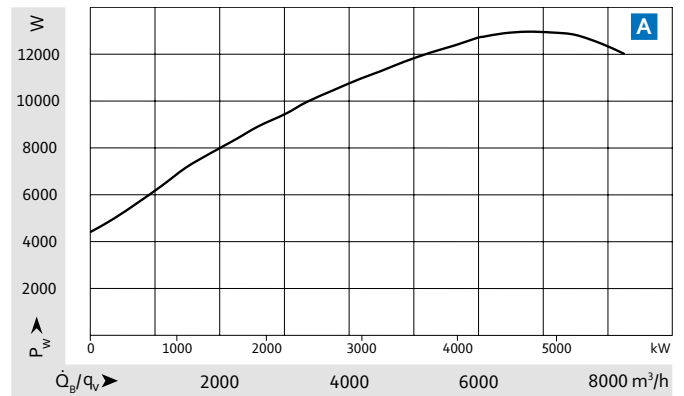
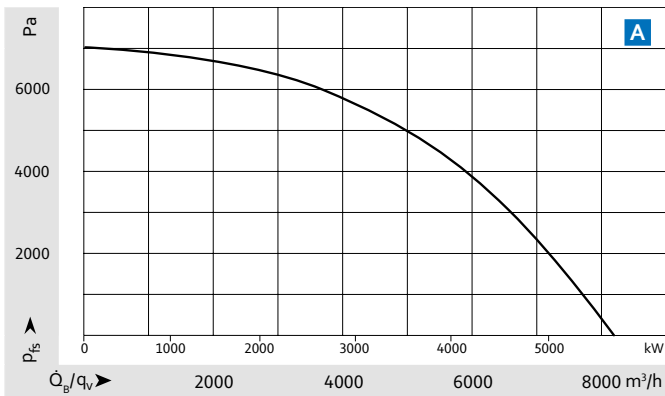
- Designed for protection class I

on page 17 Possible mounting positions

from page 48 Mains connector X, interface connector W

from page 50 Electrical interfaces

More at www.ebmpapst.com



Measuring requirements

Air performance measured in accordance with ISO 5801, installation category C.

The specifications only apply under the specified measurement conditions ($\rho=1.14 \text{ kg/m}^3 \pm 3.5\%$) and may change due to the installation conditions.

Heat output \dot{Q}_g for gas type G20 with air-fuel ratio $\lambda=1.3$.

¹ Heat output range

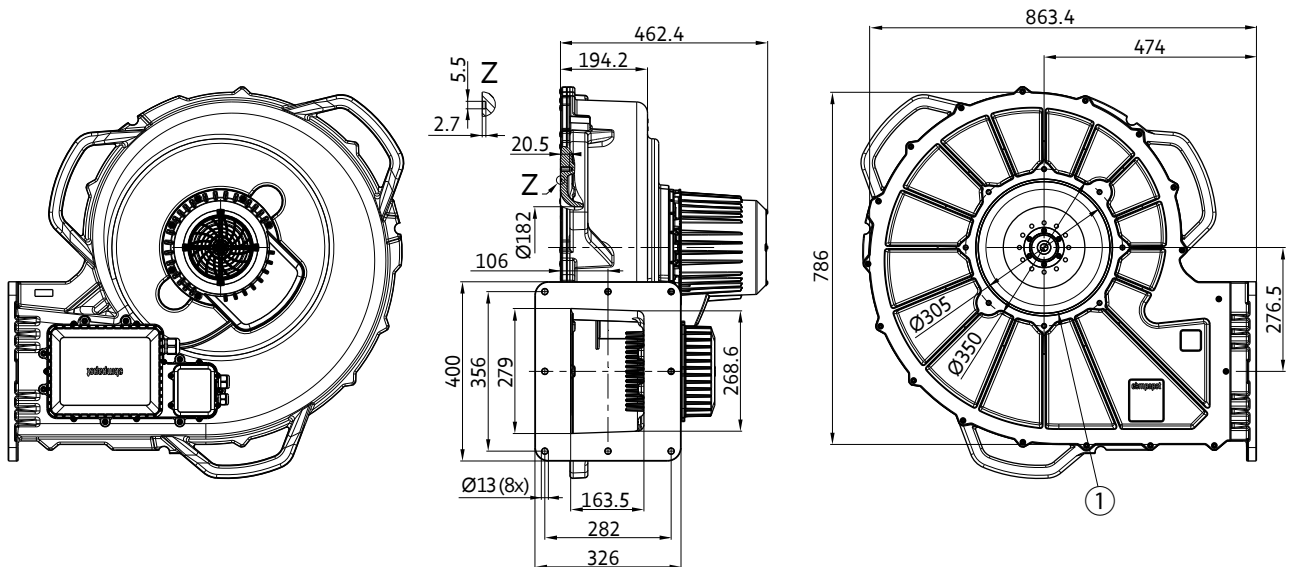
approx. data; heat output depends on gas type and the system conditions.

| Curve | Type | Part number | Max. speed n | Max. input power P _{ed} | Perm. motor ambient temperature range | Perm. conveying medium temperature range | Weight |
|---------------------------------------|--------------|-------------|--------------|----------------------------------|---------------------------------------|--|--------|
| | | | rpm | W | °C | °C | kg |
| Nominal voltage 3-380-480VAC, 50/60Hz | | | | | | | |
| A | VGR0450XTTPS | 5560008010 | 4250 | 14000 | 0 up to 40 ¹⁾ | -15 up to 50 | 85 |

¹⁾ Short-term 60°C.
 Subject to change. Temperature specifications dependent on time/temperature profile. Extended temperature range on request.

A Technical drawing

Dimensions in mm



① Seal groove

Connectors

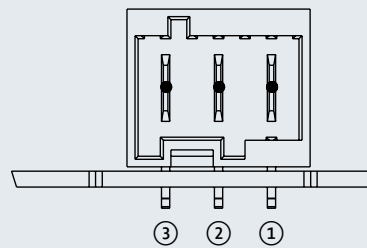
| Connector | VG 71 | VG 100 | VG 108 | NRG 118 | RG 148 | NRG 137 | RG 175 | G1G 170 | G3G 200 | G3G 250 | VG 250 | VG 315 | VG 450 |
|-------------------------|-------|--------|--------|---------|--------|---------|--------|---------|---------|---------|----------------------------|----------------------------|----------------------------|
| 1 Mains connector X | x | x | x | x | x | x | x | | | | | | |
| 2 Mains connector X | | | | x | x | x | x | x | x | x | see operating instructions | see operating instructions | see operating instructions |
| 3 Interface connector W | x | x | x | | | | | | | | | | |
| 4 Interface connector W | | | | x | x | x | x | x | | | | | |
| 5 Interface connector W | | | | | | | | | x | x | | | |
| 6 Interface connector W | | | | | | | | | | | | | |
| Interface 04600451... | 03 | 03 | 03 | 04 | 04 | 04 | 04 | 38 | 39 | 39 | 64 | 61 | 63 |

Connectors refer to 230 V versions. Other plug and interface versions on request.

1 Mains connector X

3-pin pin-connector with coding type 0A according to RAST 5 in 90° angled / horizontal design with locking feature on top or down for locking device suitable for mating connector according to RAST 5 with coding type 0A as e. g. CoHaMoYY-A5002-H03-K01 or Lumberg 3623 03 K01

Part number for mating connector:
2431045025



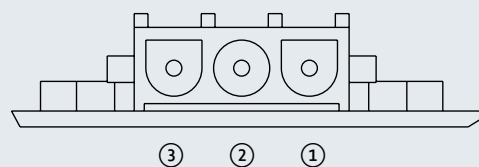
- ③ Power supply AC
- ② Protective earth
- ① Power supply AC

2 Mains connector X

3-pin pin-connector according RAST 6.35 in 90° angled / horizontal design suitable for mating connector according to RAST 6.35 e. g. Tyco Universal MATE-N-LOK

Order number: 1586847-1 and 3 x socket 926882-1

Part number for mating connector:
Connector shell 2430945012; Crimp socket 2430745002/3



- ③ Protective earth
- ② Power supply AC
- ① Power supply AC

3 Interface connector W

4-pin pin-connector according RAST 4.2
in 90° angled / horizontal design
suitable for mating connector
e. g. Stocko STO-FIT, CoHaMo

Order number Stocko:

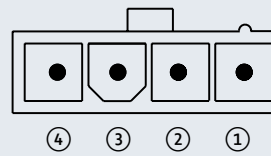
EH 705-004-004-960 and 3 x socket RBB 8230.120

Order number CoHaMo:

YY-5700-H04AS-GT and 3x socket YY-5700-TTAMA

Part number for mating connector:

Plug shell 2431045201; Crimp socket 2430045116



- ④ PWM Input
- ③ Power supply - (GND)
- ② Hall Sensor OUT
- ① NC

4 Interface connector W

5-pin pin-connector according RAST 4.2
in 90° angled / horizontal design
suitable for mating connector
e. g. Stocko STO-FIT, CoHaMo

Order number Stocko:

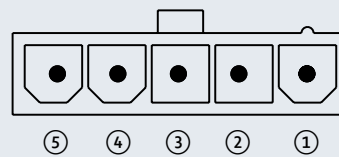
EH 705-005-004-960 and 5x socket RBB 8230.120

Order number CoHaMo:

YY-5700-H05AS-GT and 5x socket YY-5700-TTAMA

Part number for mating connector:

Connector shell 2431045200; Crimp socket 2430045116



- ⑤ Power supply - (GND)
- ④ PWM Input
- ③ NC
- ② Hall Sensor OUT
- ① Power supply +

5 Interface connector W

5-pin pin-connector according RAST 4.2
in 90° angled / horizontal design
suitable for mating connector
e. g. Stocko STO-FIT, CoHaMo

Order number Stocko:

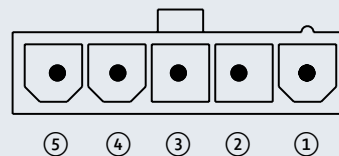
EH 705-005-004-960 and 5x socket RBB 8230.120

Order number CoHaMo:

YY-5700-H05AS-GT and 5x socket YY-5700-TTAMA

Part number for mating connector:

Connector shell 2431045200; Crimp socket 2430045116



- ⑤ Power supply - (GND)
- ④ PWM Input
- ③ Input 0-10V DC Control
- ② Hall Sensor OUT
- ① Power supply +

6 Interface connector W

5-pin pin-connector according RAST 4.2
in 90° angled / horizontal design
suitable for mating connector
e. g. Stocko STO-FIT, CoHaMo

Order number Stocko:

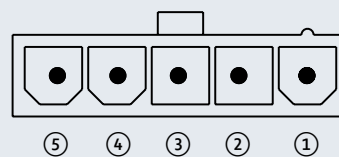
EH 705-005-004-960 and 5x socket RBB 8230.120

Order number CoHaMo:

Y-5700-H05AS-GT and 5x socket YY-5700-TTAMA

Part number for mating connector:

Connector shell 2431045200; Crimp socket 2430045116

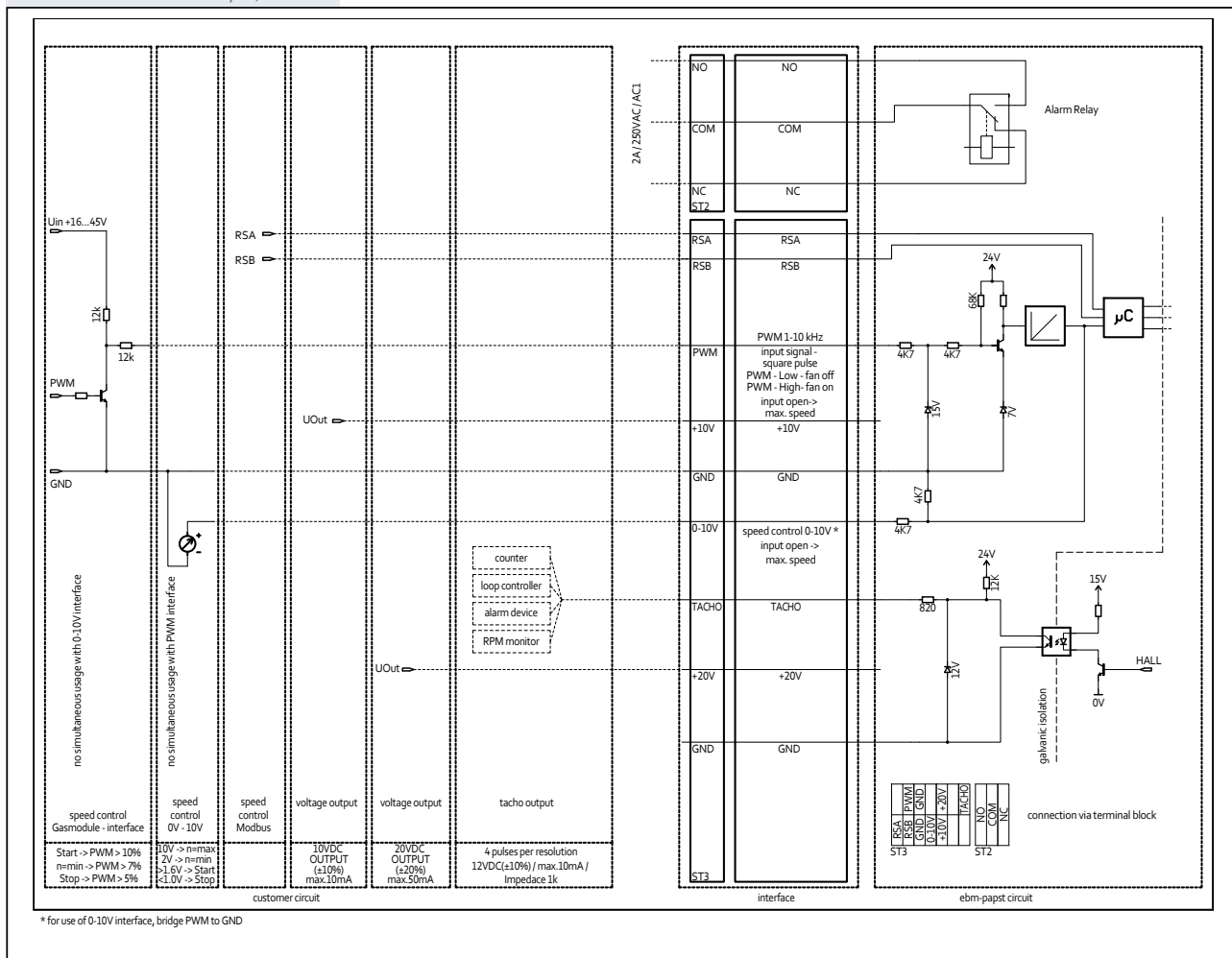


- ⑤ Power supply - (GND)
- ④ PWM Input
- ③ Input 0-10V DC Control
- ② Hall Sensor OUT
- ① Voltage Output

Electrical interfaces

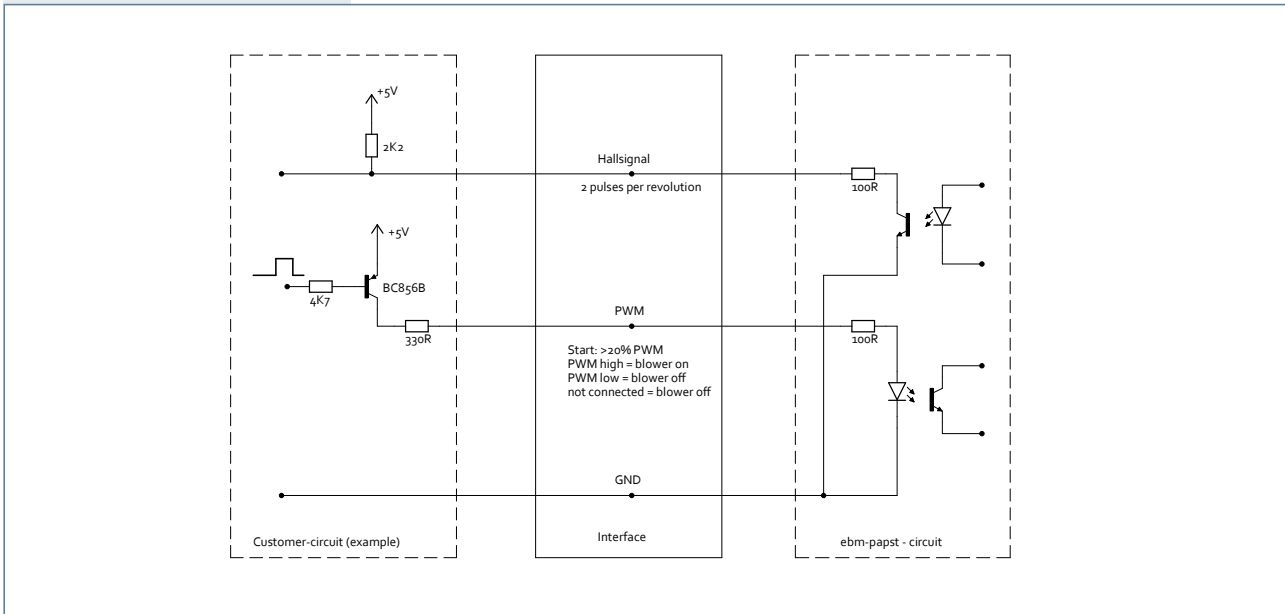
| | | | | | | | | | | | | | |
|-----------------------|-------|--------|--------|---------|--------|---------|--------|---------|---------|---------|--------|--------|--------|
| Interface 04600451... | VG 71 | VG 100 | VG 108 | NRG 118 | RG 148 | NRG 137 | RG 175 | G1G 170 | G3G 200 | G3G 250 | VG 250 | VG 315 | VG 450 |
| | 03 | 03 | 03 | 04 | 04 | 04 | 04 | 38 | 39 | 39 | 64 | 61 | 63 |

Interface 64 3-380-480VAC, 50/60Hz

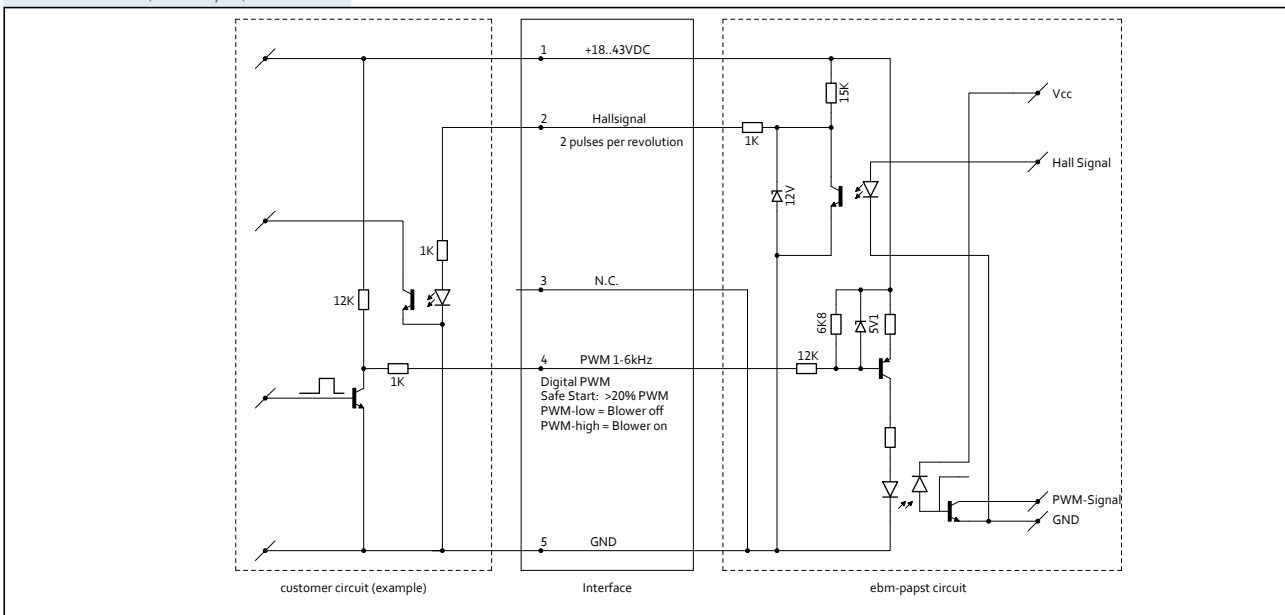


Further types available on request.

Interface 03 120/230VAC, 50/60Hz



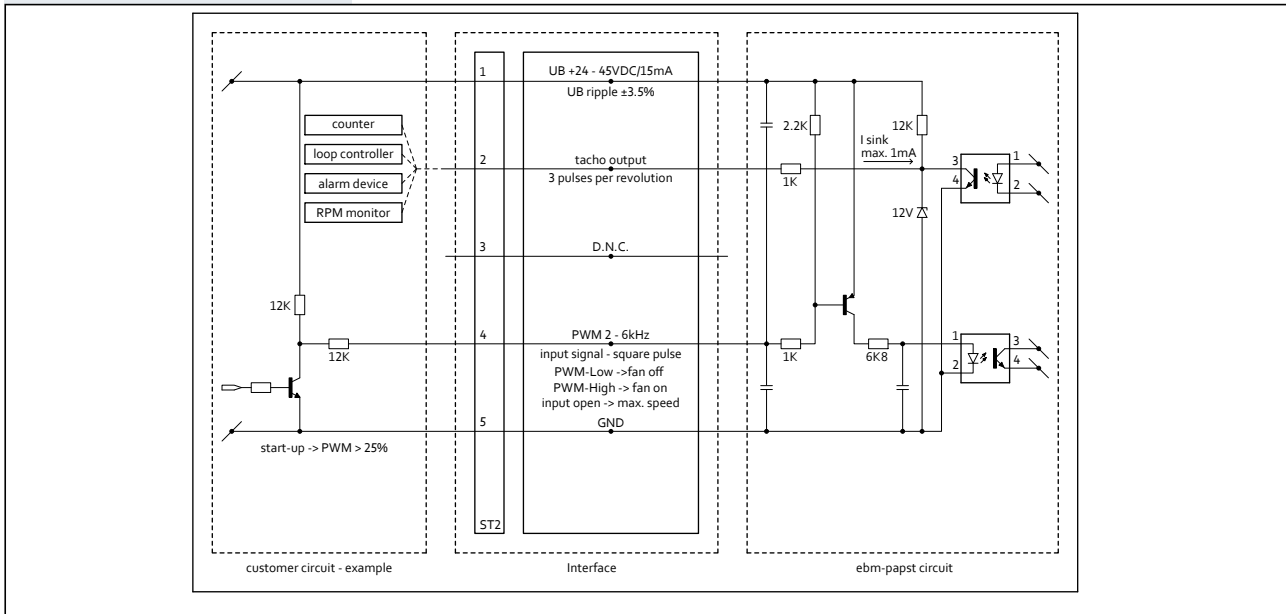
Interface 04 120/230VAC, 50/60Hz



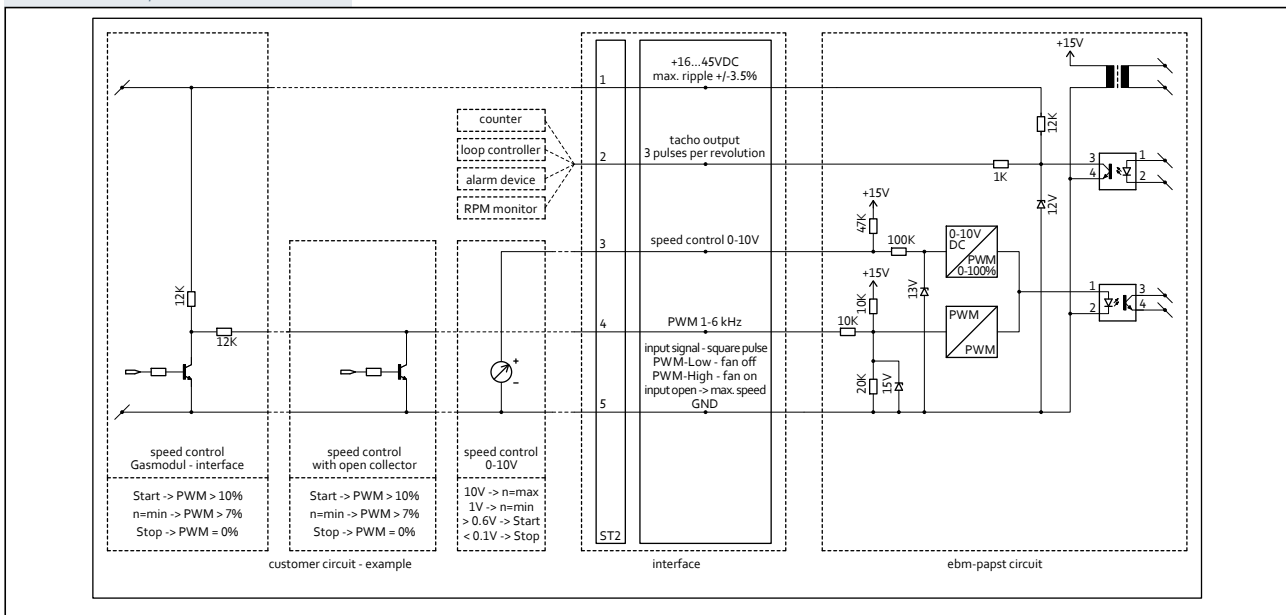
Further types available on request.

Electrical interfaces

Interface 38 115/230VAC

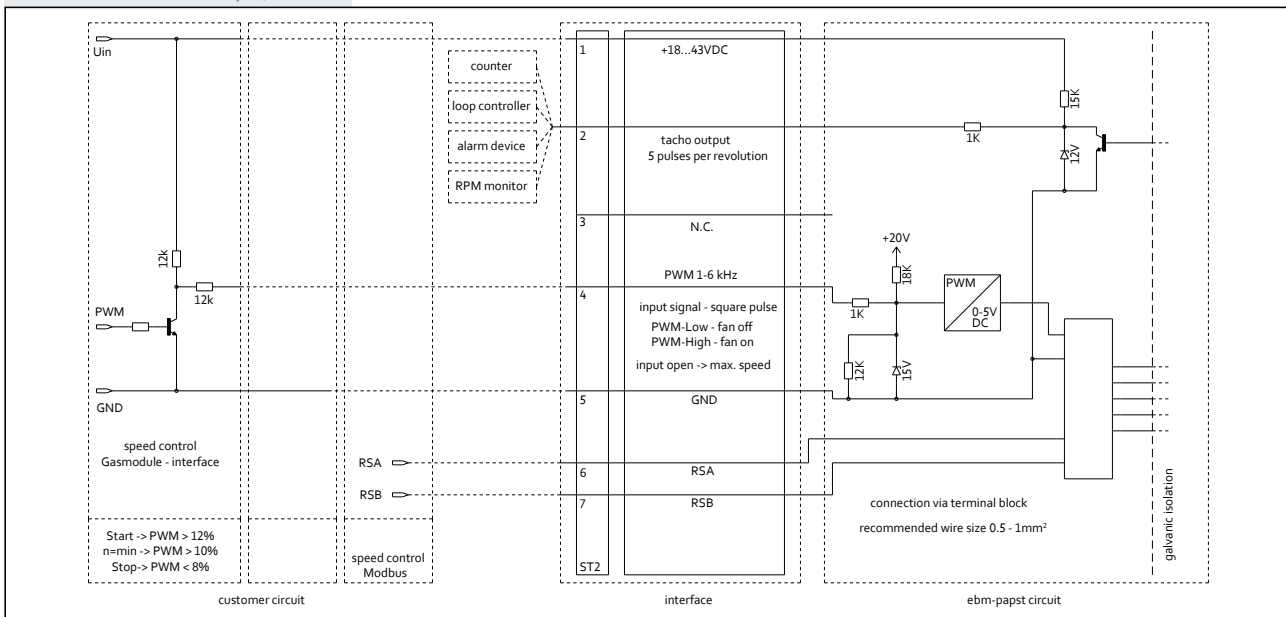


Interface 39 115/230VAC

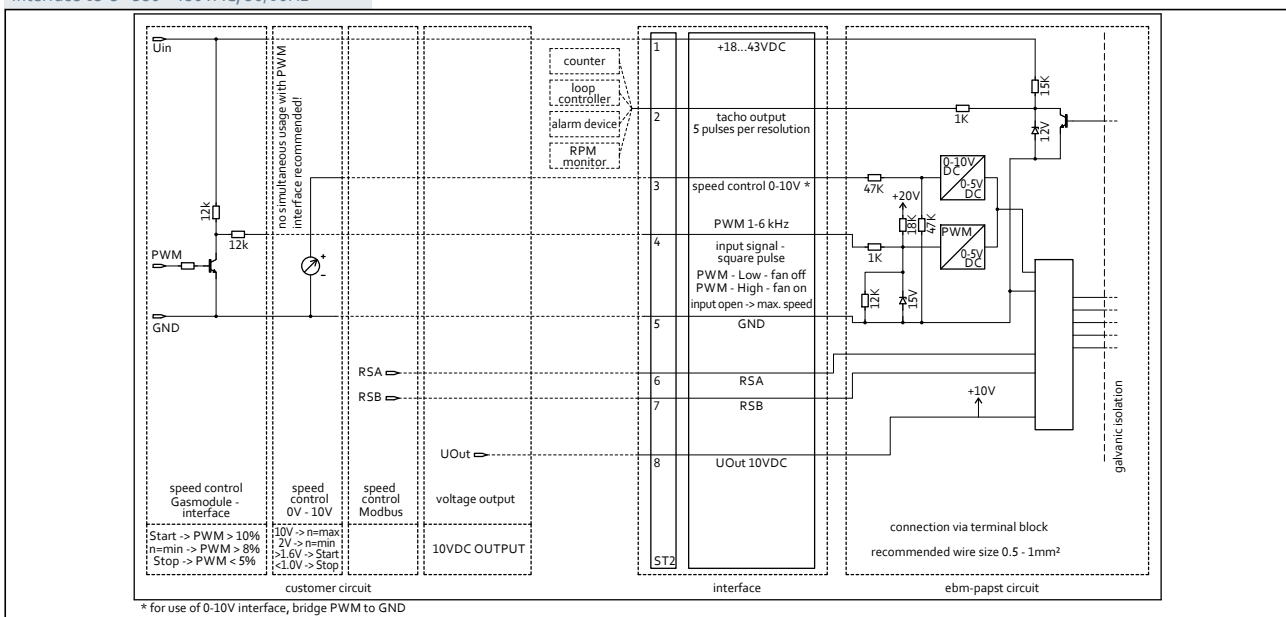


Further types available on request.

Interface 61 3~ 380-480VAC, 50/60Hz



Interface 63 3~ 380-480VAC, 50/60Hz



Further types available on request.

Gas valves

Pneumatic and electronic gas-air control system

Our gas valves are mainly used in condensing unit applications for domestic heating technology in the low-to-medium output range. They ensure precise gas-air ratio adjustment.

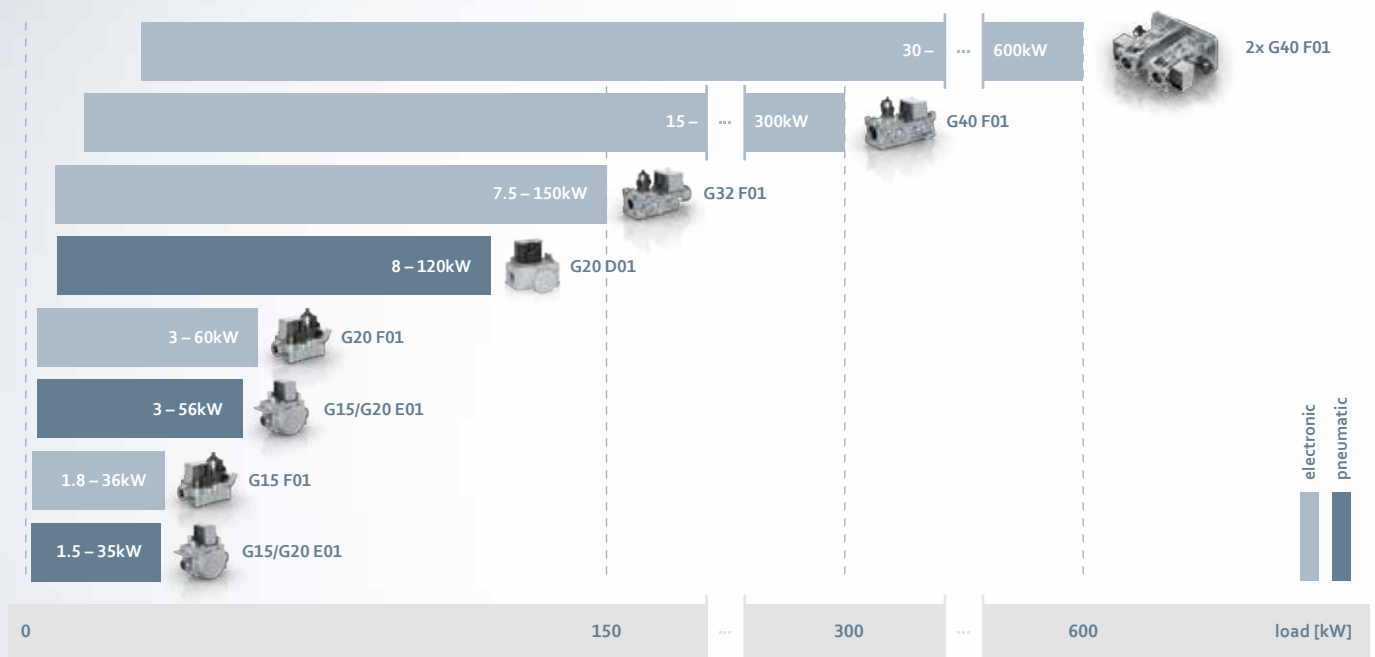
The G20 D01 and G15/G20 E01 gas valves are suitable for condensing units with pneumatic gas-air control systems.

Regardless of the suction pressure generated by the premix blower, these gas valves always keep the offset pressure at zero and compensate for pressure fluctuations in the supply network as well.

The offset (zero point shift) can be configured at the servo controller. At the same time, the desired gas quantity is adjusted using an integrated flow control element. Depending on the design, reference pressure can be connected to the servo controller if required.

The G15/G20 F01, G32 F01 and G40 F01 gas valves are suitable for condensing units with electronic gas-air control systems. Regardless of gas quality and any pressure fluctuations in the supply network, these gas valves regulate the constant gas-air ratio without relying on mechanical gas valve settings.

Gas valves



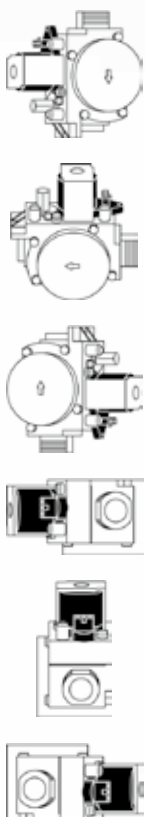
Additional notes

- Work on the gas valve is to be performed by authorised specialists only.
- Please ensure observation of the corresponding installation instructions.
- Corresponding documents with safety instructions are available upon request or on the Internet.



+ Mounting position

Solenoid at any position between vertical & horizontal – but not upside down



+ Type examination certificate for North America (USA and Canada): Master Contract No. 172723

Applicable standards
ANSI Z21.78 · CSA 6.20-2010
(Reaffirmed 2014):
Combination Gas Controls for gas appliances

Approvals exist for the chief gas consuming countries.

+ Type examination certificate Product ID number: CE0085CM0036

Applicable directives and standards:
EU/2016/426 Gas Appliances Regulation

- EN 126:2012 06: Multifunctional controls for gas burning appliances
- EN 13611:2016: Safety and control devices for gas burners and gas burning appliances – General requirements
- EN 161:2013: Automatic shut-off valves for gas burners and gas appliances
- EN 88-1:2016: Pressure regulators and associated safety devices for gas appliances – Part 1: Pressure regulators for inlet pressures up to and including 50kPa



Gas valves pneumatic gas-air control system

G15/G20 E01



Material/surface

- Housing: Aluminum

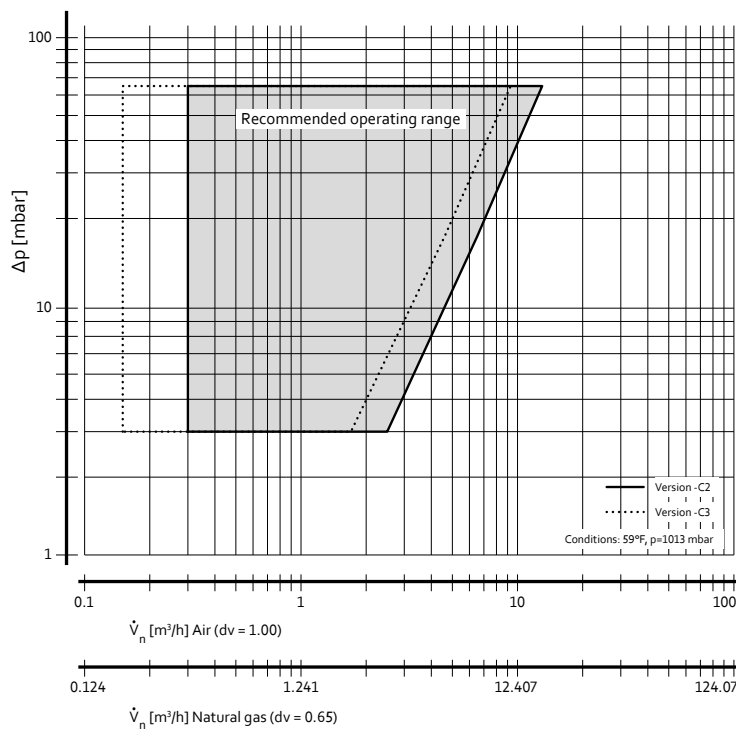
Mechanical data

- Degree of protection: IP40 in combination with a suitable plug
- Permitted gas families: II + III (in accordance with EN 437)
- Maximum inlet pressure: 65mbar (CE), 0.5psi (CSA)
- Permitted ambient temperature: -15°C to 70°C; extended temperature range on request, dependent on time/temperature profile
- Permitted storage temperature: -25°C to 70°C
- Offset correction: +/- 20Pa
- Input (gas connection): External thread G3/4 or G1/2 (EN ISO 228) or 4 x M4-mounting holes (optional)
- Output: ebm-papst proprietary quick release
- Safety valve: Coaxial design: Valve class B/C as per EN 161

More at

www.ebmpapst.com

Capacity curve – GXXE01-BCXCS-CX



Electrical data

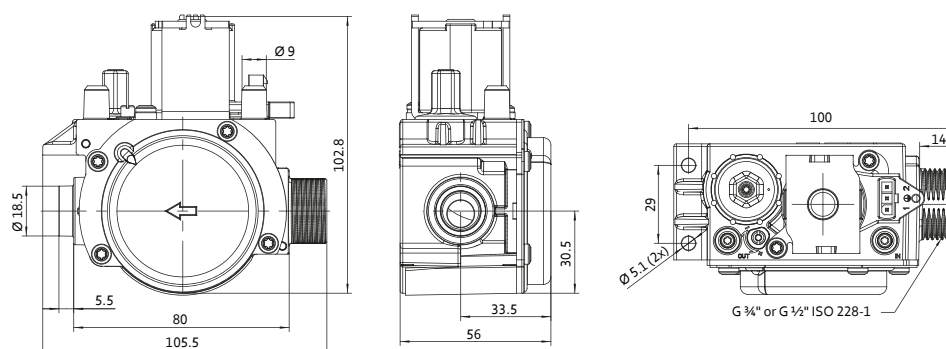
- Designed for protection class I
- Electrical connection: Connector shell with 4.20mm grid

| Type | Rated voltage | Max. input power | Nominal diameter | Maximum inlet pressure | Flow rate (at $\Delta p = 5\text{mbar}$) | Automatic shutoff valves (EN 161) | Minimum signal pressure | Opening and closing time | Weight |
|---------------------|---------------|------------------|------------------|------------------------|---|-----------------------------------|-------------------------|--------------------------|--------|
| | V | VA | | mbar | m ³ /h | | Pa | s | kg |
| Nominal data | | | | | | | | | |
| GXXE01-BCXCS-CX | 230RAC | 9.8 | DN15/20 | 65 | 3.4 | Class B/C | -40 | < 1 | 0.57 |
| | 120RAC | 9.8 | DN15/20 | 65 | 3.4 | Class B/C | -40 | < 1 | 0.57 |
| | 24RAC | 9.8 | DN15/20 | 65 | 3.4 | Class B/C | -40 | < 1 | 0.57 |
| | 24DC | 9.8 | DN15/20 | 65 | 3.4 | Class B/C | -40 | < 1 | 0.57 |
| | 22DC | 11.9 | DN15/20 | 65 | 3.4 | Class B/C | -40 | < 1 | 0.57 |

Subject to change.

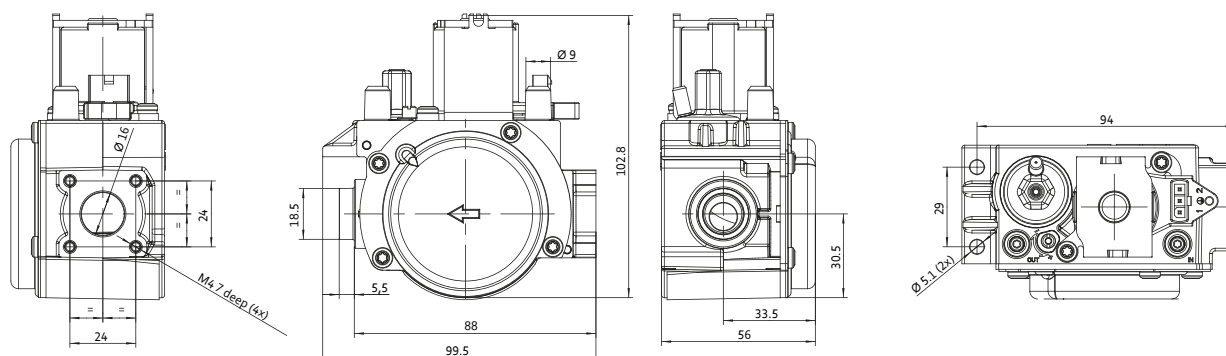
Version with G 3/4 connection (optionally also G 1/2)

Dimensions in mm



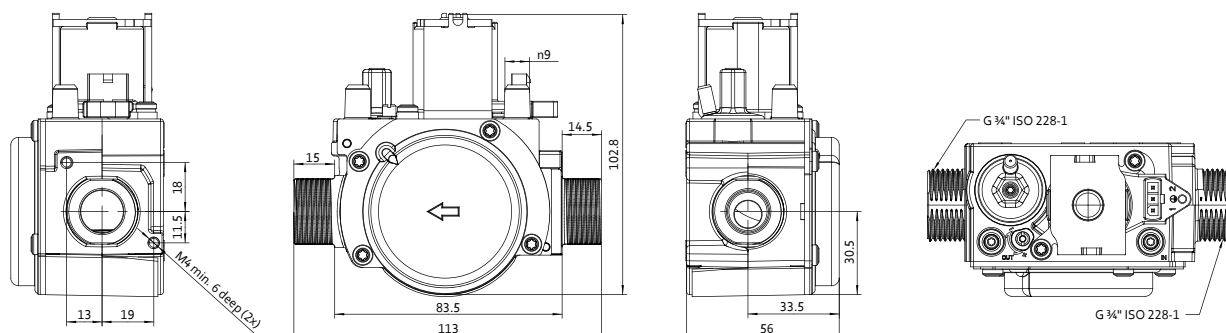
Version with 4 x M4 connection (suitable for NPT 1/2 flange)

Dimensions in mm



Version with 2 x G 3/4 connection

Dimensions in mm



Gas valves pneumatic gas-air control system

G20 D01



More at

www.ebmpapst.com

Material/surface

- Housing: Aluminum

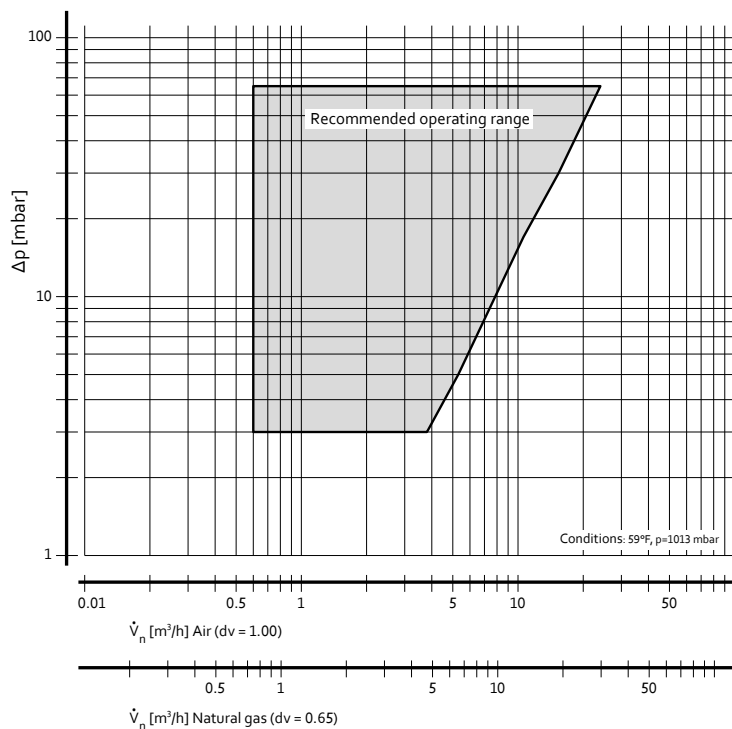
Mechanical data

- Degree of protection: IP40 in combination with a suitable plug
- Permitted gas families: II + III (in accordance with EN 437)
- Maximum inlet pressure: 65mbar (CE), 0.5psi (CSA)
- Permitted ambient temperature: -15°C to 60°C; extended temperature range on request, dependent on time/temperature profile
- Permitted storage temperature: -25°C to 70°C
- Offset correction: +/- 20Pa
- Input (gas connection): 4 x M5-mounting holes (hole spacing 36mm)
- Output: 4 x M5-mounting holes (hole spacing 36mm)
- Safety valve: Valve class B/B as per EN 161

Electrical data

- Designed for protection class I
- Electrical connection: Connector shell with 5.08mm grid

Capacity curve – G20D01-BBXCS-CX

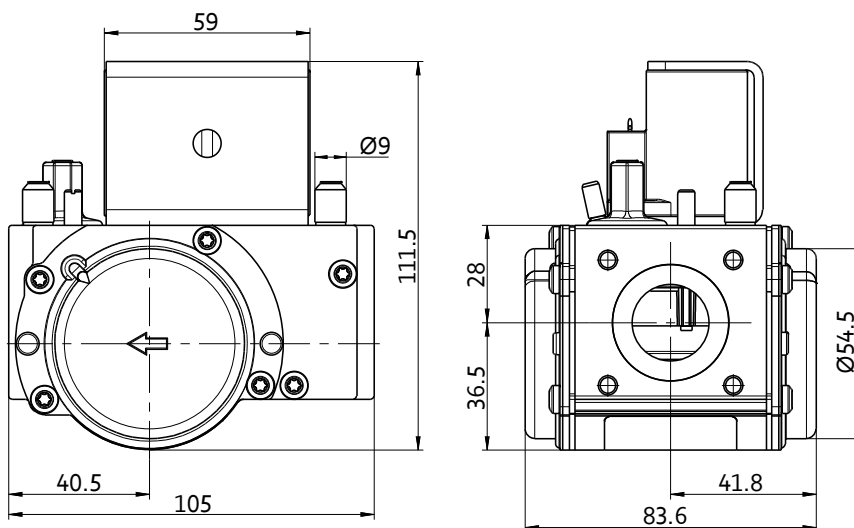


| Type | Rated voltage | Max. input power | Nominal diameter | Maximum inlet pressure | Flow rate (at $\Delta p = 5\text{mbar}$) | Automatic shutoff valves (EN 161) | Minimum signal pressure | Opening and closing time | Weight |
|------------------------|---------------|------------------|------------------|------------------------|---|-----------------------------------|-------------------------|--------------------------|--------|
| | V | VA | | mbar | m ³ /h | | Pa | s | kg |
| Nominal data | | | | | | | | | |
| G20D01-BBXCS-CX | 230RAC | 2 x 12.5 | DN20 | 65 | 5.3 | Class B/B | -40 | < 1 | 1.3 |
| | 120RAC | 2 x 12.5 | DN20 | 65 | 5.3 | Class B/B | -40 | < 1 | 1.3 |
| | 24RAC | 2 x 12.5 | DN20 | 65 | 5.3 | Class B/B | -40 | < 1 | 1.3 |
| | 24DC | 2 x 12.5 | DN20 | 65 | 5.3 | Class B/B | -40 | < 1 | 1.3 |

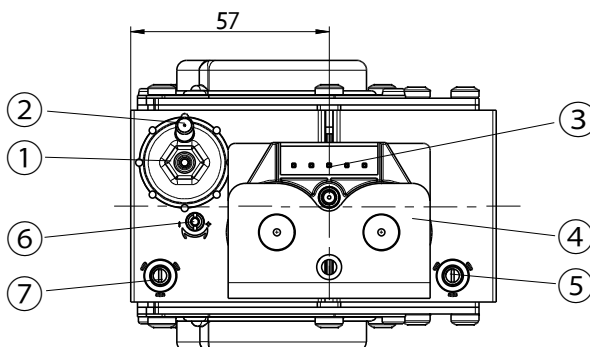
Subject to change.

Technical drawing

Dimensions in mm



- ① Pressure regulator offset adjustment
- ② Servo regulator
- ③ Electrical connection
- ④ Solenoid coil
- ⑤ Pressure test nipple P₁
- ⑥ Main flow throttle
- ⑦ Pressure test nipple P₂



Gas valves electronic gas-air control system

G15/G20 F01



Material/surface

- Housing: Aluminum

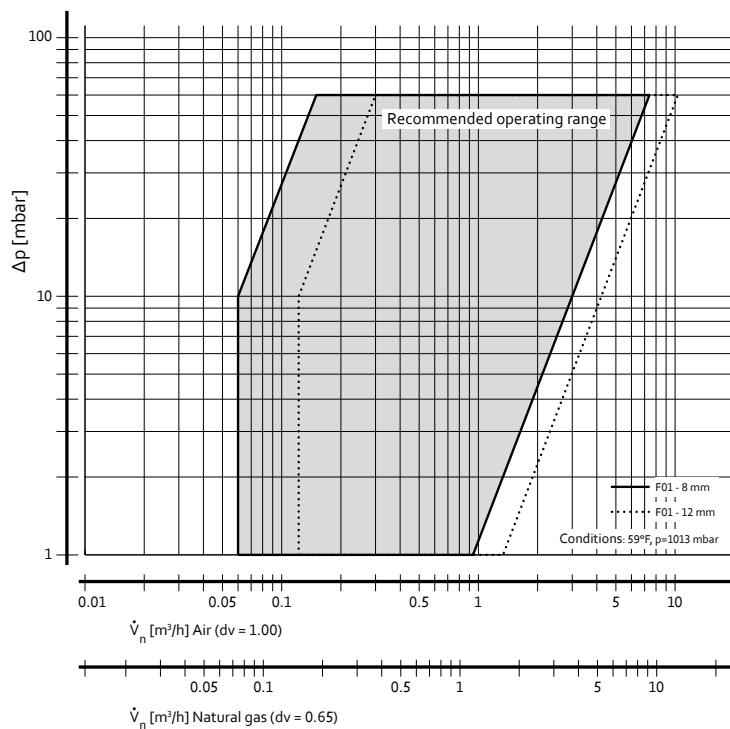
Mechanical data

- Degree of protection: IP40 in combination with a suitable connector
- Permitted gas families: II + III (in accordance with EN 437)
- Maximum inlet pressure: 60mbar (CE), 0.5psi (CSA)
- Permitted ambient temperature: -15°C to 70°C; extended temperature range on request, dependent on time/temperature profile
- Permitted storage temperature: -25°C to 70°C
- Input (gas connection): External thread G 1/2" (DN 15) or G 3/4" (DN 20) (EN ISO 228)
- Output: ebm-papst proprietary quick release
- Safety valves: Coaxial design: Valve class B/C as per EN 161

More at

www.ebmpapst.com

Capacity curve – GXXF01-BCXCS-CX



Electrical data

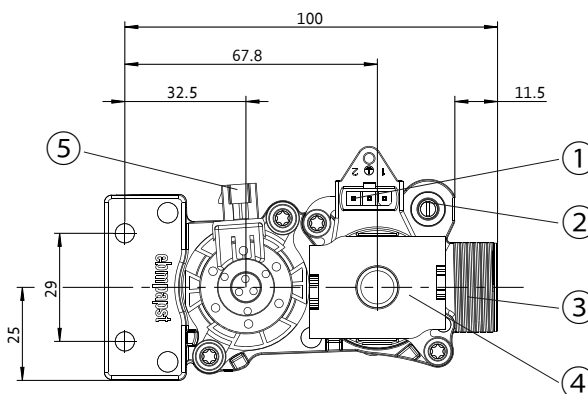
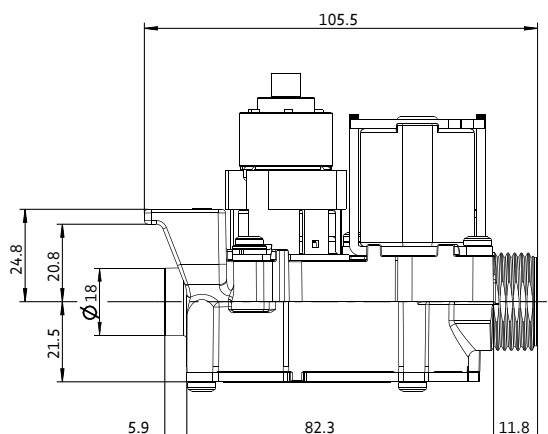
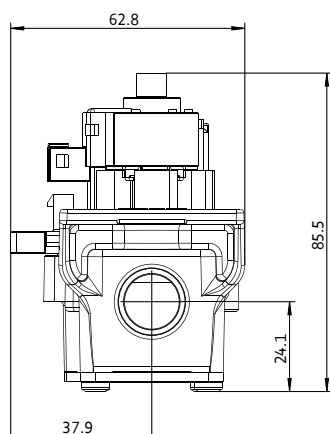
- Designed for protection class I
- Electrical connection: Connector shell with 4.20mm grid

| Type | Rated voltage V | Max. input power VA | Nominal diameter DN15/20 | Maximum inlet pressure mbar | Flow rate (at $\Delta p = 5\text{mbar}$) Stepper motor module with nominal diameter 8mm m ³ /h | Flow rate (at $\Delta p = 5\text{mbar}$) Stepper motor module with nominal diameter 12mm m ³ /h | Automatic shutoff valves (EN 161) | Opening and closing time s | Weight kg |
|-----------------|--------------------|------------------------|-----------------------------|--------------------------------|--|---|---|----------------------------------|--------------|
| Nominal data | | | | | | | | | |
| GXXF01-BCXCS-CX | 230RAC | 9.8 | DN15/20 | 60 | 2.1 | 2.9 | Class B/C | < 1 | 0.47 |
| | 120RAC | 9.8 | DN15/20 | 60 | 2.1 | 2.9 | Class B/C | < 1 | 0.47 |
| | 24RAC | 9.8 | DN15/20 | 60 | 2.1 | 2.9 | Class B/C | < 1 | 0.47 |
| | 24DC | 9.8 | DN15/20 | 60 | 2.1 | 2.9 | Class B/C | < 1 | 0.47 |
| | 22DC | 11.9 | DN15/20 | 60 | 2.1 | 2.9 | Class B/C | < 1 | 0.47 |

Subject to change.

Technical drawing

Dimensions in mm



- ① Electrical connection safety valve
- ② Pressure test nipple
- ③ G 3/4" or G1/2" ISO 228-1
- ④ Solenoid coil
- ⑤ Electrical connection stepper motor

Gas valves electronic gas-air control system

G32 F01



More at

www.ebmpapst.com

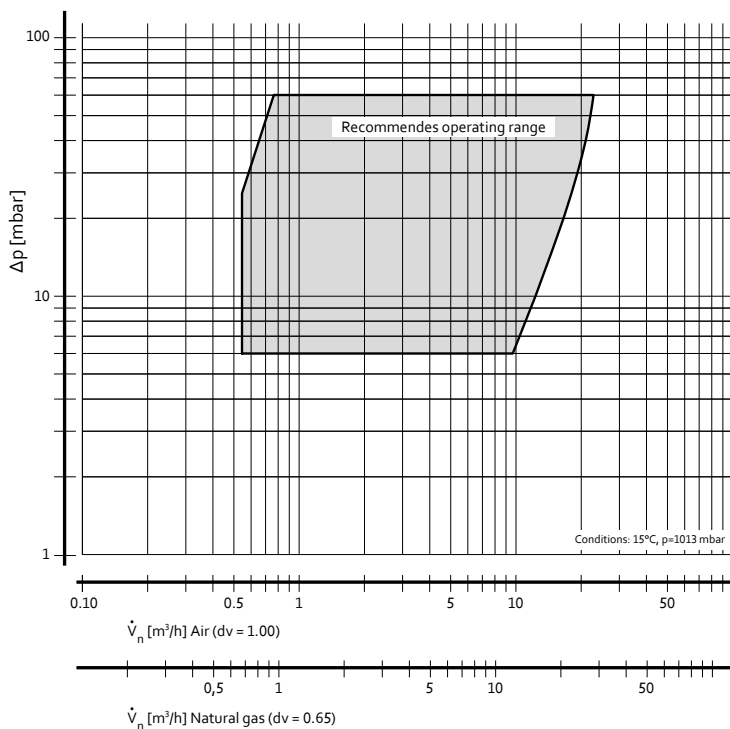
Material/surface

- Housing: Aluminum

Mechanical data

- Degree of protection: IP40 in combination with a suitable connector
- Permitted gas families: I + II + III (in accordance with EN 437)
- Maximum inlet pressure: 60mbar (CE), 0.5psi (CSA)
- Permitted ambient temperature: -15°C to 60°C; extended temperature range on request, dependent on time/temperature profile
- Permitted storage temperature: -25°C to 70°C
- Input (gas connection): external thread G 1 1/4 (EN ISO 228)
- Output: Flange connection 4 x mounting holes for self-tapping screw (nominal diameter 5mm); hole spacing \square 52.33mm
- Safety valves: Coaxial design: Valve class B/C in accordance with EN 161
- Interface to mechanical pressure monitor port: Inlet pressure; central chamber pressure
- Pressure test nipple: Inlet and outlet pressure

Capacity curve – G32F01-CBXCS-CX



Electrical data

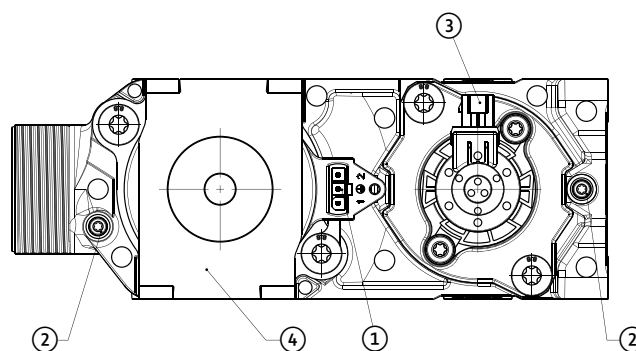
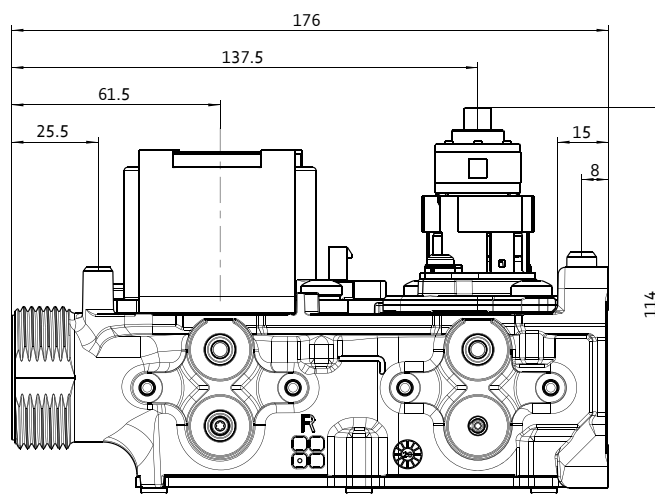
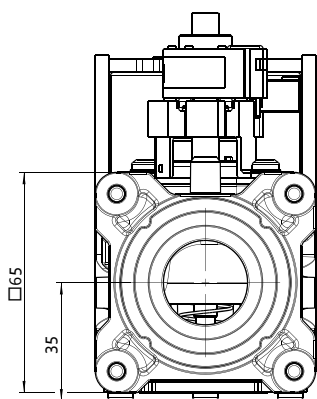
- Designed for protection class I
- Electrical connection: Safety module: suitable for connector housing with pitch 4.20mm (e.g., Stocko STO-FIT System, EH 705-103; Würth series WR-MPC4, item no. 649 003 013 322)
- Stepper motor module: Connector housing Stocko-Grid MH790-06-001

| Type | Rated voltage V | Max. input power VA | Nominal diameter | Maximum inlet pressure mbar | Flow rate (at Δp = 5mbar) m³/h | Automatic shutoff valves (EN 161) | Opening and closing time s | Weight kg |
|------------------------|--------------------|------------------------|------------------|--------------------------------|--------------------------------------|--------------------------------------|-------------------------------|--------------|
| Nominal data | | | | | | | | |
| G32F01-CBXCS-CX | 230RAC | 17 | DN32 | 60 | 9.3 | Class C/B | < 1 | 1.55 |
| | 120RAC | 17 | DN32 | 60 | 9.3 | Class C/B | < 1 | 1.55 |
| | 24DC | 17 | DN32 | 60 | 9.3 | Class C/B | < 1 | 1.55 |

Subject to change.

Technical drawing

Dimensions in mm



- ① Electrical connection safety valve
- ② Pressure test nipple
- ③ Electrical connection control valve
- ④ Solenoid coil

Gas valves electronic gas-air control system

G40 F01



Material/surface

- Housing: Aluminum

Mechanical data

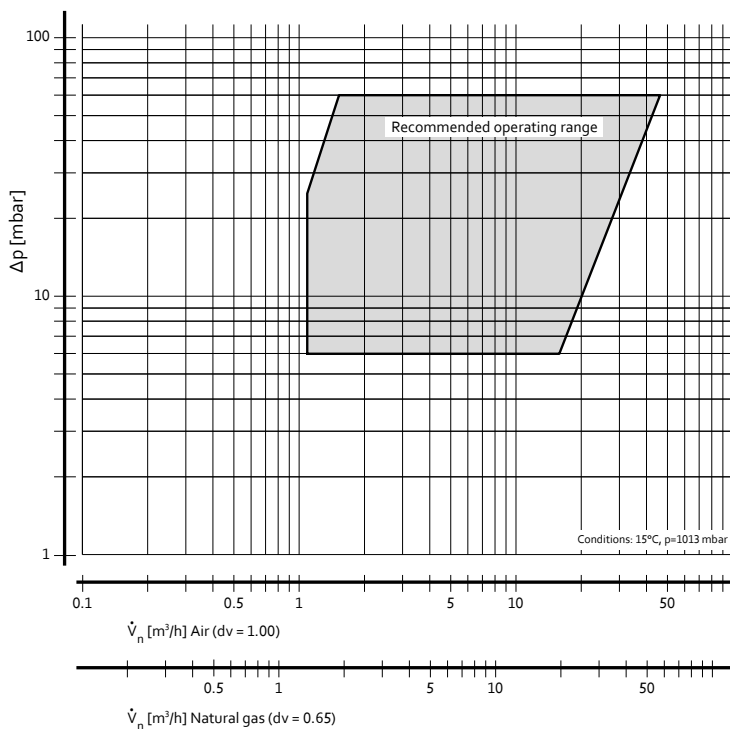
- Degree of protection: IP40 in combination with a suitable connector
- Permitted gas families: I + II + III (in accordance with EN 437)
- Maximum inlet pressure: 60mbar (CE), 0.5psi (CSA)
- Permitted ambient temperature: -15°C to 60°C; extended temperature range on request, dependent on time/temperature profile
- Permitted storage temperature: -25°C to 70°C
- Input (gas connection): Flange connection 4 x mounting holes for self-tapping screw (nominal diameter 6mm); hole spacing $\square 52.33\text{mm}$; bolt circle diameter 74mm; Input flange G 1 1/2" optional
- Output: Flange connection 4 x mounting holes for self-tapping screw (nominal diameter 6mm); hole spacing $\square 52.33\text{mm}$; bolt circle diameter 74mm
- Safety valve: Coaxial design: External thread B/B as per EN 161
- Interface to mechanical pressure monitor port: Inlet pressure; central chamber pressure for VPS (optional)
- Pressure test nipple: Inlet and outlet pressure

Electrical data

- Designed for protection class I
- Electrical connection: Suitable for connector housing with pitch 4.20mm (e.g., Stocko STO-FIT System, EH 705-103; Würth WR-MPC4 series, item no. 649 003 013 322)
- Stepper motor module: Connector housing Stocko-Grid MH790-06-001

More at www.ebmpapst.com

Capacity curve – G40F01-BBXCS-CX

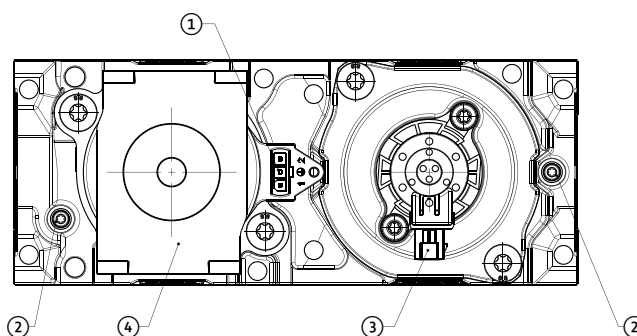
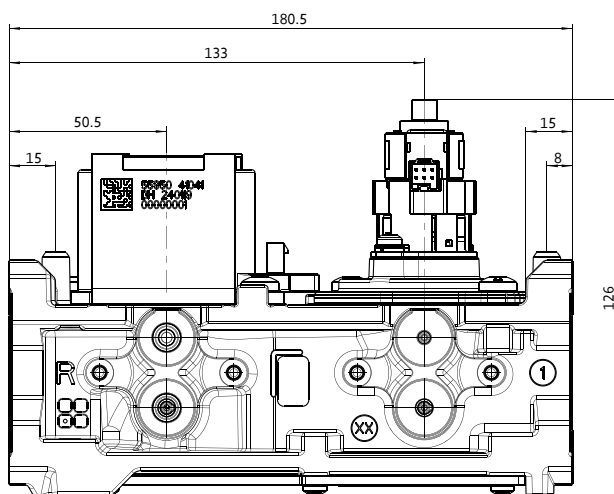
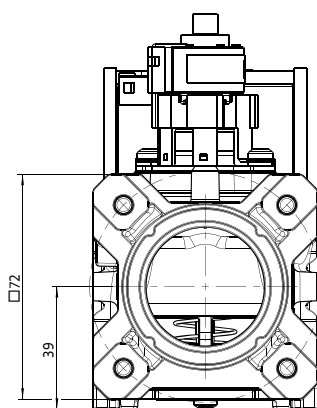


| Type | Rated voltage V | Max. input power VA | Nominal diameter | Maximum inlet pressure mbar | Flow rate (at $\Delta p = 5\text{mbar}$) m^3/h | Automatic shutoff valves (EN 161) Class B/B | Opening and closing time s | Weight kg |
|------------------------|--------------------|------------------------|------------------|--------------------------------|---|---|-------------------------------|--------------|
| Nominal data | | | | | | | | |
| G40F01-BBXCS-CX | 230RAC | 21.5 | DN40 | 60 | 14 | Class B/B | < 1 | 1.97 |
| | 120RAC | 22 | DN40 | 60 | 14 | Class B/B | < 1 | 1.97 |
| | 24DC | 22 | DN40 | 60 | 14 | Class B/B | < 1 | 1.97 |

Subject to change.

Technical drawing

Dimensions in mm



- ① Electrical connection safety valve
- ② Pressure test nipple
- ③ Electrical connection control valve
- ④ Solenoid coil

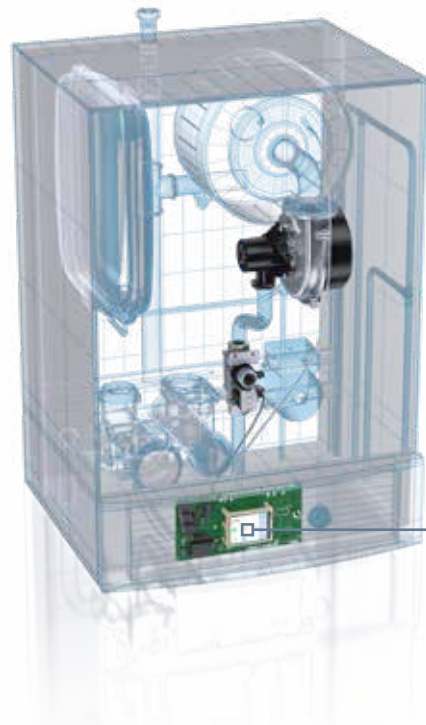
Boiler Control Units

Intelligent and customizable

We supply the right electronics for controlling ignition, performance regulation and monitoring the function of the condensing boiler as well as user interfaces needed for conveniently controlling central heating and hot water. Our product range, consisting of tried-and-tested hardware and software, enables reliable operating performance and short development cycles. The versatile software architecture allows easy interface integration. In addition, as with our blowers, we value having the lowest possible energy consumption.

The BCU 100 boiler controls are specially designed for use in wall-hang boiler: compact design and high integration of all electrotechnical functions of a modern wall-mounted condensing boiler.

The BCU 900 boiler controls are used in particular for commercial building technology: high functional scope with flexible setting options for the configuration of many heating systems.



Compact construction

- + Comprehensive electronic functions of a gas-condensing boiler
- + Solid-state design for high reliability, long service life and low space requirement
- + Integrated user interface
- + Space-saving and robust electrical connection with plated contacts

Optimally networked



- + Standard interfaces for room devices
- + RS 485 interface for user-defined control elements e.g. building management systems
- + Prepared for Plug-in modules to realize various communication options
- + Predictive maintenance via advance warning messages
- + Remote access for improved diagnostics



Boiler Control Units – Residential technology

BCU 100



Technical Data

- Wide range power supply 170–264VAC with voltage supervision
- PWM or LIN interface for blower and pump control
- Diverter valve stepper motor interface 24VDC
- DHW turbine 5VDC with supply
- Water pressure switch 5VDC
- Control of pneumatic or electronic gas valve 24VDC
- Ext. spark generator 230VAC
- Flow, return, flue, DHW and outside temperature sensor inputs
- Analog ionization input, all nets, reversed polarity

Mechanical data

- Rast-2.5 and rast-2.5-power direct connection
- PCB dimensions (LxWxH): 200x100x26mm

Benefits of the Boiler Control Unit

- ✓ Pneumatic (CleanEco) or electronic (CleanVario) gas-air ratio control
- ✓ Starts and monitors the boiler
- ✓ Fan control
- ✓ Boiler temperature control and safety temperature limiter
- ✓ Domestic hot water and central heating control
- ✓ Integrated flexible user interface and various display technologies available for standard and customer-specific designs
- ✓ Combines tried and tested hardware and software modules from a comprehensive modular system
- ✓ Flexible production of variants thanks to different electronic component configurations
- ✓ Variant management due to a comprehensive selection of parameter banks
- ✓ One product platform for various methods of gas-air ratio controls

Boiler Control Units – Commercial technology

BCU 900

+ Application

- For commercial applications above 50kW (up to 2MW boilers)
- Integrated cascade control
- Flexibility to configure many systems: preset appliance types
- Configurable inputs and outputs
- Integrated low water cutoff
- Many modes for CH and DHW



+ User Interfaces

- Touchscreen: communication with boiler control via Modbus
- Ethernet connection to web server via web module
- Graphical LCD interface for boiler status, operation and configuration
- Password-protected user levels
- Includes diagnostics software and a smart app for remote control

Boiler Control Units – Commercial technology Packages



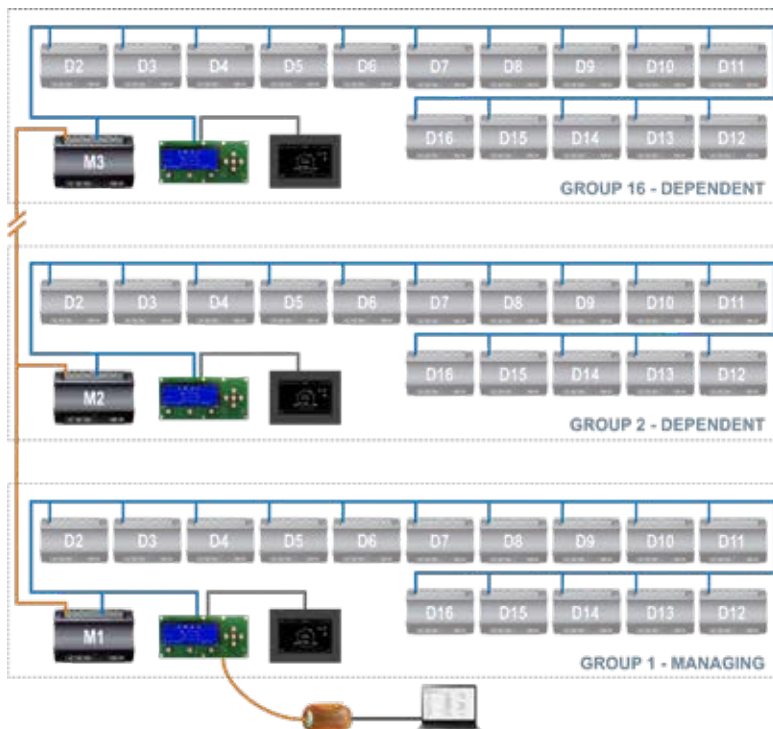
Description

- Stand-alone and sequenced devices
- Flexible setup and easy configuration
- Multiple heat demand options (on/off, OpenTherm, 0–10V)
- Internal/external spark igniter or hot-surface igniter
- Primary safeguard functions
- Extra safety- and smart control functions

| | Cascade operation | Touch screen | User interface | AL-BUS | Modbus | Ethernet | Diagnostics software | Smart app |
|--|-------------------|--------------|----------------|--------|--------|----------|----------------------|-----------|
|--|-------------------|--------------|----------------|--------|--------|----------|----------------------|-----------|

| Packages | | | | | | | | |
|------------------|-------------------------|---|-----------------------------------|---|---|----------|---|---|
| Commercial Plus | 16 boilers x 16 modules | ✓ | 900PB Display + 900TS Touchscreen | ✓ | ✓ | ✓ | ✓ | ✓ |
| Commercial | max. 16 boilers | – | 900PB Display | ✓ | ✓ | optional | ✓ | ✓ |
| Residential Plus | settings only | – | 900LB Display | ✓ | – | – | ✓ | ✓ |

Commercial Plus with integrated cascade control: Up to 16 boilers x 16 modules (1 managing group and 15 dependent groups) can be connected (max. 256 boilers).



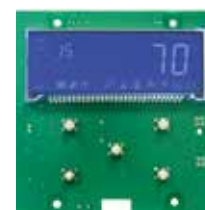
Managing group 1: M1, D2, D3, ...
 Dependent group 2: M2, D2, D3, ...



900PB Display (Cover assembly)



900TS Touchscreen



900LB Display

Boiler control units

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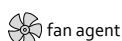
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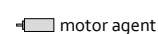
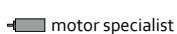
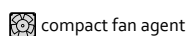
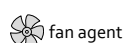
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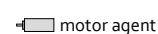
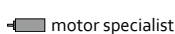
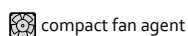
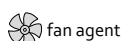
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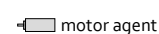
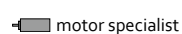
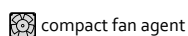
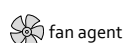
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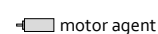
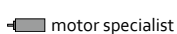
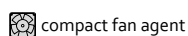
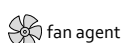
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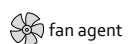
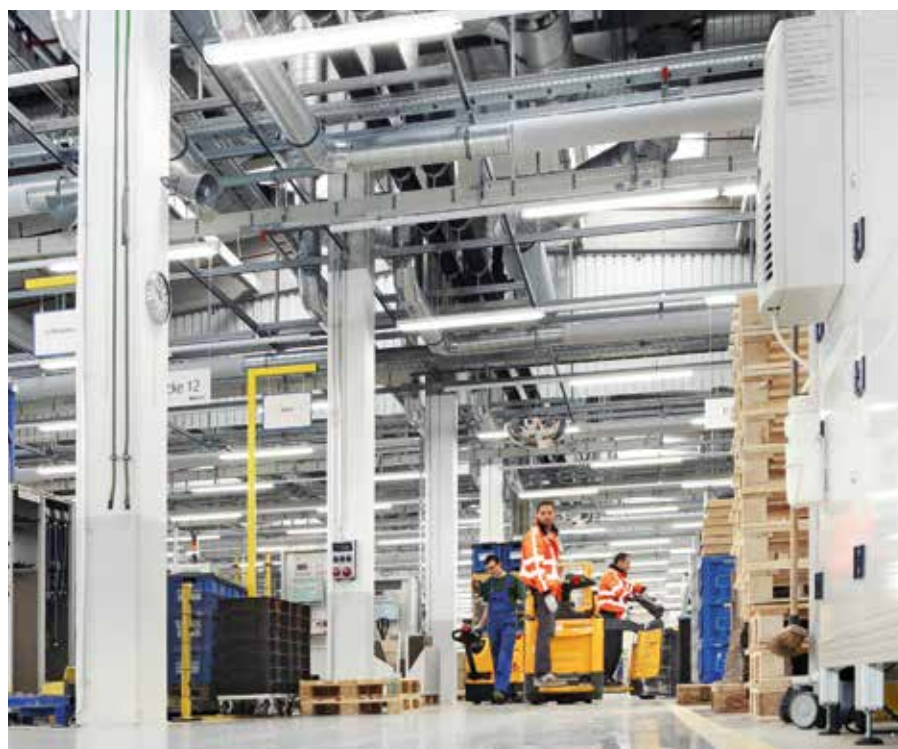
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