

BRAVO Single Duct System



Single room ventilation in accordance with DIN 18017

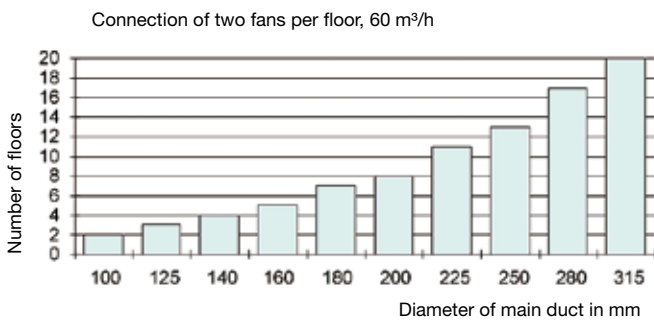
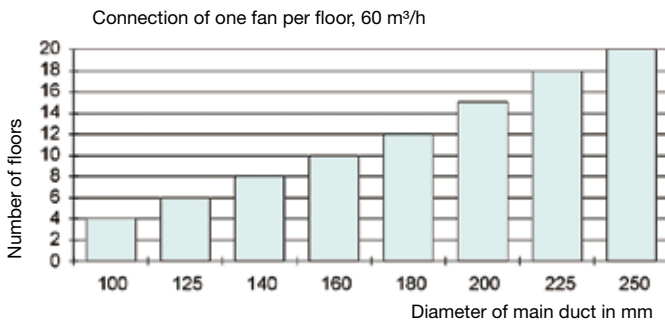
DIN 18017 regulates the ventilation of bathrooms and toilets without windows, so called single duct ventilation. The basic load requirement (12h/day) is 40 m³/h for a bathroom and 20 m³/h for a toilet. For ventilation on demand the requirement is 60 m³/h for a bathroom and 30 m³/h for a toilet. Kitchens without windows require in basic load an exhaust air volume of min. 60 m³/h, on demand an air volume of 100 m³/h. In multi storey buildings all units have to exhaust the same required air volumes. A tolerance of +/- 15% is accepted, due to influences of the weather conditions and when several units are running at the same time.

An open area of minimum 150 cm² has to be provided for the supply of make up air. This is often solved by installing a grille into the door of the bathroom or toilet. Supply air openings in the outer building walls have to be provided.

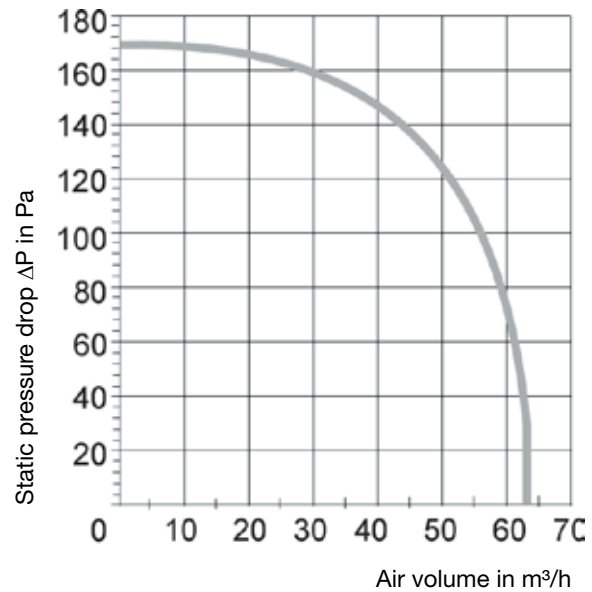
System design

The exhaust air ducts have to have the same diameter over the whole length. The execution has to be airtight and stable. Condensate drains and cleaning lids have to be provided. Those parts of the duct which are installed in a cold area have to have a diffusion resistant insulation to prevent the development of condensation. The top of the duct can be covered by standard roof hoods or deflector hoods. The fans can be flush mounted in in-wall casings or surface mounted. The mounting and installation has to fulfill local regulations for fire protection.

Duct dimensioning for BRAVO:



Air volume diagram BRAVO (60 m³/h):



Single duct system BRAVO



DIBT approval
Z-51.1 - 55

- Single duct system with approval of the German building inspectorate in accordance with DIN 18017 Part 3. To be used in bathrooms, toilets and kitchens/kitchenettes without windows. The modular design allows a fast and easy installation in ducts, dry walls or ceilings.
- All fan sets can be installed into either the standard casing KSG or the fire protected casing BSG. Alternatively, all fan sets can be directly installed into dry walls or suspended ceilings, by using BRAVO FLS exhaust air set – no casing is required then (details see following pages).
- All fan sets with centrifugal impellers with forward curved blades, driven by long life external rotor motors with ball bearings. Motors protected by thermal contacts.
- Delivered with connection plug, white cover and filter in EU2.

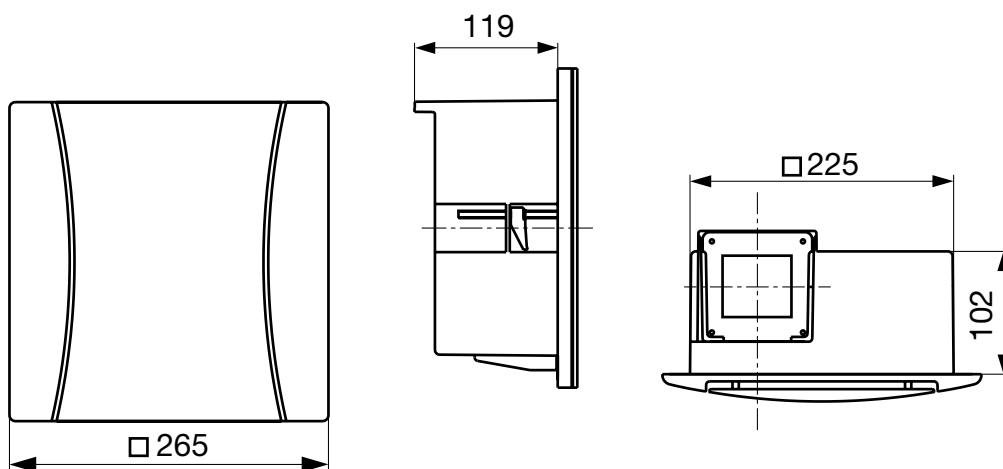
All fan sets 230V/50Hz

Type	V/m ³ /h	P/W	Amp.	Lp in dB (A)*
VE 30/60/90 G	30/60/90	8/16/34	0,08/0,12/0,15	29/33/39
VE 60 Z	60	16	0,12	33
VE 90 Z	90	34	0,15	39

* Ao = 10 m² Sabine

Dimensions: (Drawing shows fan with FLS exhaust air set)

Protection class IPX5 (jet water protected)
Max. medium temperature 60°C for constant voltage of 230V, 40°C when voltage is fluctuating by +/- 10%.



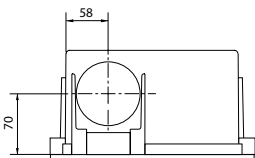
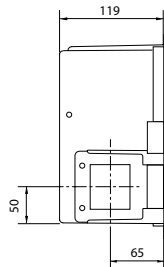
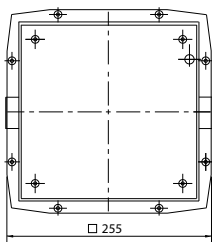
Single duct system BRAVO, standard casing KSG



- Standard casing KSG, manufactured from high-impact Ps polystyrene, can be directly bolted into/onto the wall. All KSG casings with back draught damper and plaster cover with "finder".
- In combination with the maintenance free fire protection set BRAVO WKH-K (accessory) this execution fulfills fire protection requirements L90.

KSG standard casing, without fire protection

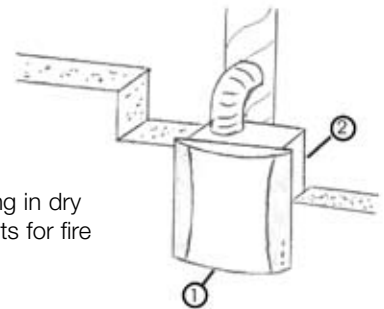
- Casing for flush mounting in walls or ceilings



- alle Maßangaben in mm, Änderungen vorbehalten 04/07 -

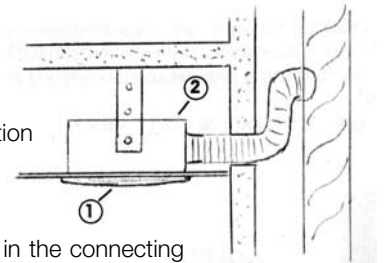
Installation example:

- flush mounting, mounting in dry walls, without requirements for fire protection



- ① BRAVO fan set
- ② KSG standard casing

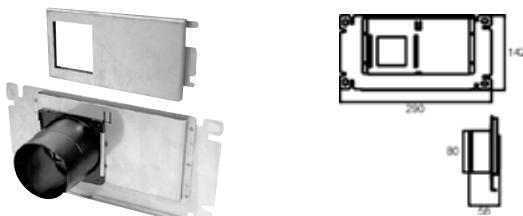
- ceiling mounting, without requirements for fire protection



- a 300mm offset in height in the connecting duct fulfills the fire protection requirements!

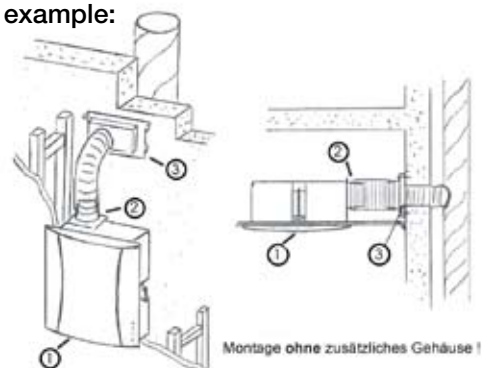
Accessories: Fire protection set BRAVO WKH-K:

- Fire protection set consisting of maintenance free fire damper BRAVO Kasette and wall frame WKH
- For mounting on ventilation duct walls in accordance with DIN 18017 part 3, in any mounting position.
- Fire protection class K90-18017, rated diameter DN80
- wall frame BRAVO WKH and BRAVO Kasette manufactured from stainless steel, Kasette with thermal fuse
- comes with fixing material and polyamide connecting flange DN75-80 to connect to the fan set respectively the duct



Installation example:

- installation in dry walls or suspended ceilings; fire protection by fire protection set BRAVO WKH-K



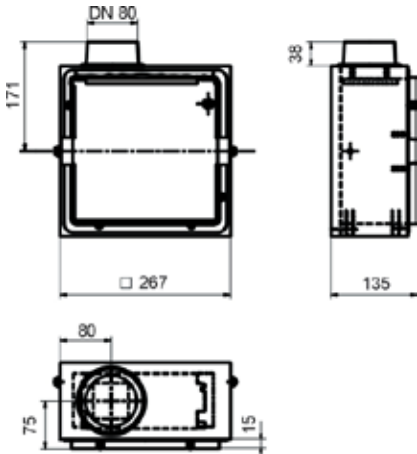
- ① BRAVO fan set
- ② BRAVO FLS exhaust air set
- ③ BRAVO WKH-K fire protection set

Single duct system BRAVO, casing BSG with fire protection



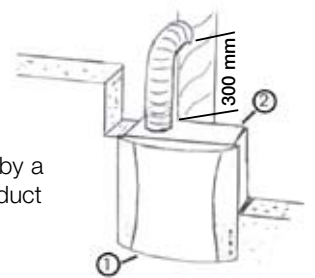
- Fire protected casing BSG, fire protection class F90 for wall or ceiling installation.
- All BSG casings with back draught damper, mounting bracket and plaster cover with “finder”.
- In combination with the maintenance free fire protection set BRAVO WKH-K (accessory) this execution fulfills fire protection requirements L90.

-flush mounted casing in fire protection class F90 for installation in wall or ceiling
 -to be used in bathrooms and toilets and combined with BRAVO cassette fire damper also for windowless kitchens/ kitchenettes.



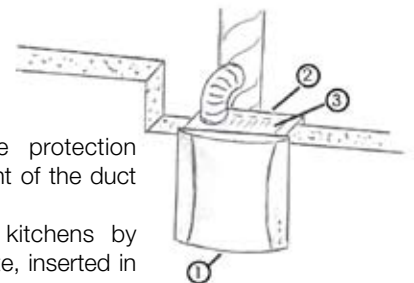
Installation example:

- flush mounting, fire protection by a 300mm offset in height of the duct connection



- ① BRAVO fan set
- ② flush mounting casing BRAVO BSG
- ③ fire damper BRAVO Kasette

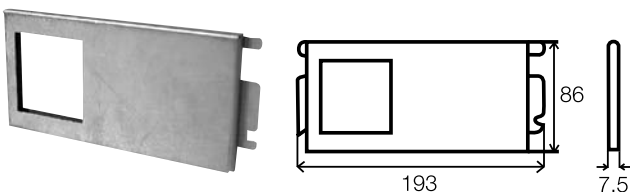
- Flush mounting, fire protection without offset in height of the duct connection.
 Possible to use in kitchens by using BRAVO Kasette, inserted in BRAVO BSG



Accessories:

Fire damper BRAVO Kasette:

-maintenance free, patented fire damper K90-18017, to be inserted in fire protection casing BSG (for kitchens and for mounting without offset in height of the duct connection)
 -approval of the building inspectorate, for mounting on walls and ceilings



Single duct system BRAVO

Possible installations in accordance with DIN 18017 part 3:

Without fire protection:

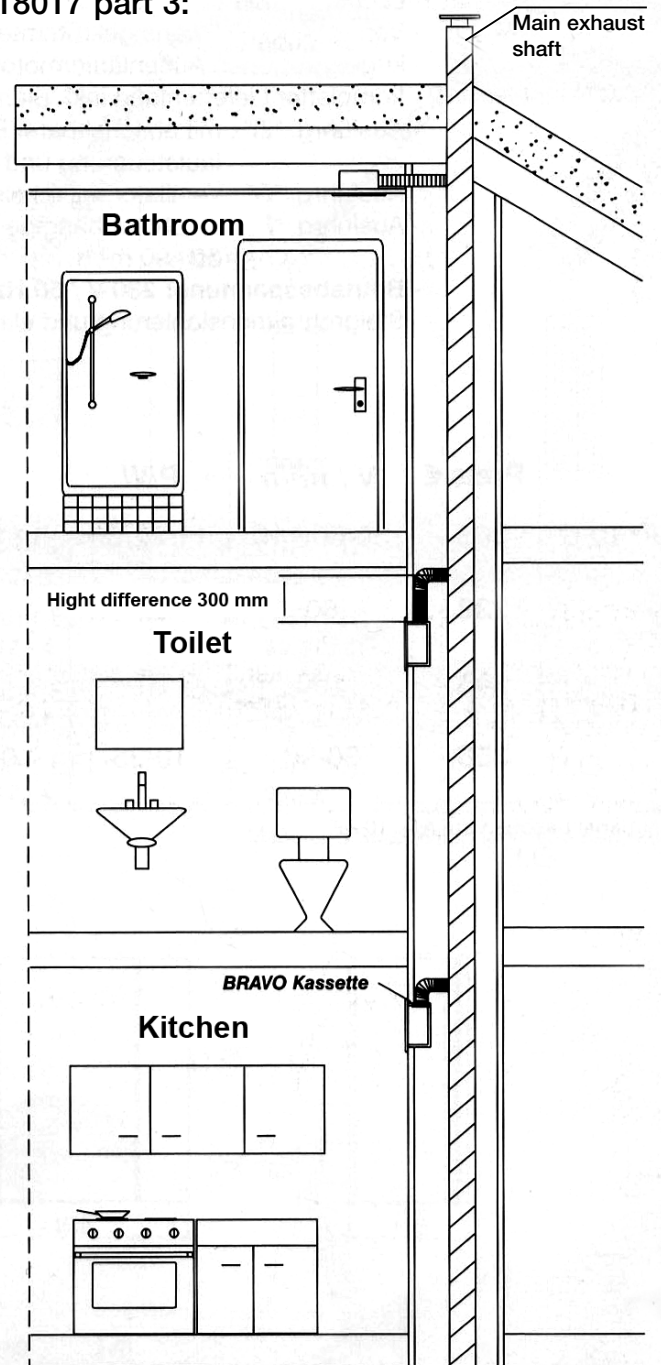
- fan set BRAVO, to be directly installed in suspended ceiling (i.e. wooden ceiling) or dry wall

With fire protection:

- fire protected casing BRAVO BSG
- fan set BRAVO
- fire protection by 300mm offset in height of duct connection in the ventilation shaft

With fire protection:

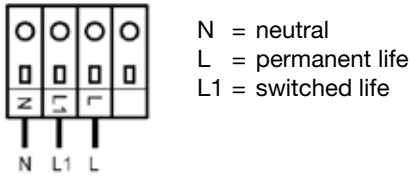
- fire protected casing BRAVO BSG
- fan set BRAVO
- fire damper BRAVO-Kassette (also suitable for kitchens), inserted in BSG



Wiring diagrams

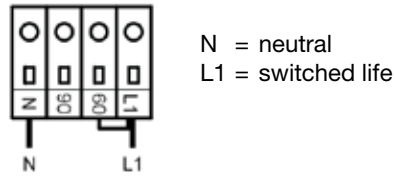
Electrical connection:
BRAVO 60Z, 90Z

Connection plug BRAVO



Electrical connection:
BRAVO 30/60/90G (60m³/h)

Connection plug BRAVO



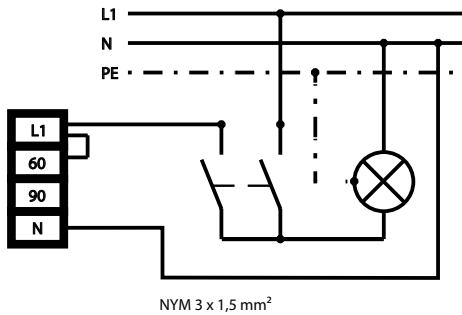
Electrical connection:
BRAVO VE 30/60/90 G

ATTENTION: The electrical connection has to be carried out by trained personnel, in accordance with local regulations or VDE 0100. During mounting and installation work, the fan unit has to be disconnected from the mains, with a minimum contact distance of 3mm. Due to the protective insulation of the unit (plastic casing and capsulated electronics) in accordance with protection class II, VDE 0106 part1, there is no need to connect an earth wire.

Technical data of BRAVO fan units:

- Air volume 30m³/h : 230 V ~ 50 Hz, 80mA, 8 W, 29 dB (A)
- Air volume 60m³/h : 230 V ~50 Hz, 115 mA, 16 W, 33 dB (A)
- Air volume 90m³/h : 230 V ~50Hz, 150 mA, 34 W, 39 dB (A)

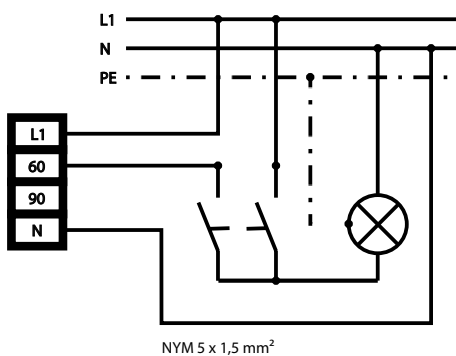
To be selected: Rated load, basic load or full load operation



BRAVO VE 30/60/90 G

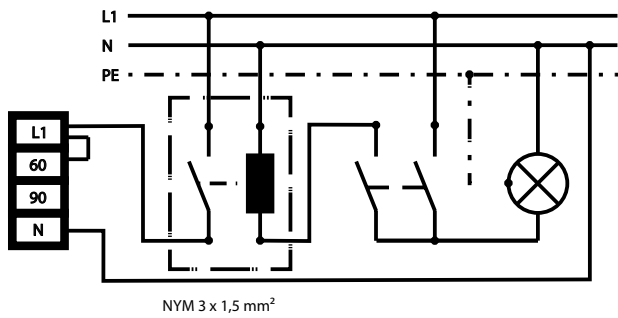
- Fan is running at 60 m³/h (rated load) when the light is being switched on
- For 30 m³/h (basic load) → remove bridge L1-60
- For 90 m³/h (full load) → change connection of block L1 to block 90

Permanent operation, basic load to be switched to rated load



Fan is permanently running at 30 m³/h (basic load), when light is being switched on the fan changes to 60 m³/h (rated load)

If a timer is being installed (i.e. switch/distribution box)



Fan starts running approx. 1 minute after the light has been switched on (delayed start), and runs on for about 7 minutes, after the light has been turned off (run-on function).

Wiring diagrams

Electrical connection:

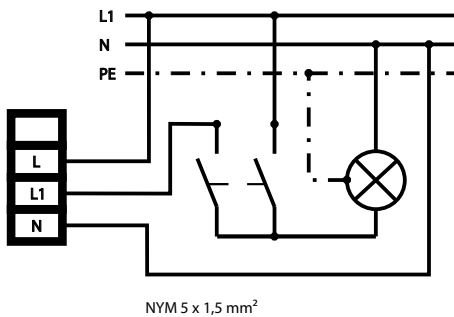
BRAVO VE 60Z/90Z

ATTENTION: The electrical connection has to be carried out by trained personnel, in accordance with local regulations or VDE 0100. During mounting and installation work, the fan unit has to be disconnected from the mains, with a minimum contact distance of 3mm. Due to the protective insulation of the unit (plastic casing and capsulated electronics) in accordance with protection class II, VDE 0106 part1, there is no need to connect an earth wire.

BRAVO VE 60 Z: 230 V ~ 50 Hz, 115 mA, 16 W

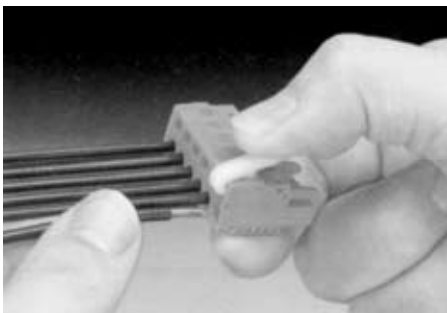
BRAVO VE 90 Z: 230 V ~ 50 Hz, 150 mA, 34 W

With integrated run-on timer:



- BRAVO VE 60 Z (60 m³/h, rated load)
- BRAVO VE 90 Z (90 m³/h, full load)

- Fan starts running after approx. 1 minute after the light has been switched on (delayed start) and continues running for about 7 minutes after the light has been switched off (run-on timer).
- Automatic cut-out after one hour running time:
 - If the light has erroneously not been switched off, the fan automatically stops running after one hour permanent operation.



- Use attached mounting device to connect the wires to the terminal.

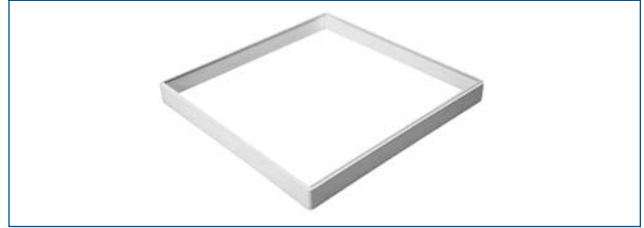
FLS



Exhaust air set

To be used for fan set installation without casing. Consisting of 1 exhaust air flange with integrated back draught damper, connection 75/89.

AGR



Level frame

To be used for casings protruding the wall, height 20 mm.

EFI

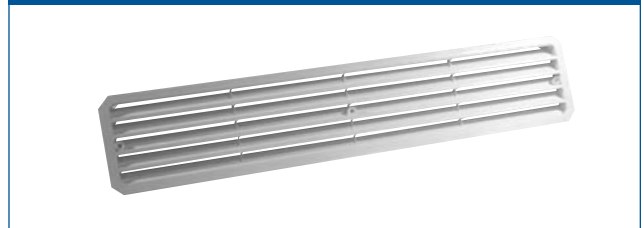


Spare filter for fan set

Dimensions: 140 x140 mm

Fleece filter to protect the fan against dirt. Should be exchanged twice a year (package contains 5 pcs)

TLG



Door grille (available in different colours)

Dimension: 435 x76 mm

To be installed in the door, serves as supply opening for make up air.

NLE



Run-on timer (electronic)

Delayed start function, can be set between 3 sec. and 2.5 min. Run-on time, can be set between 3 and 10 min.. Max Amp: 0,6A



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