



Axial flow fan AXICO ANTI-STALL®



Model FPAC and FPMC axial flow fans with controllable pitch blades.

Air flow range: 3 - 110 m³/s (10.000 – 400.000 m³/h).

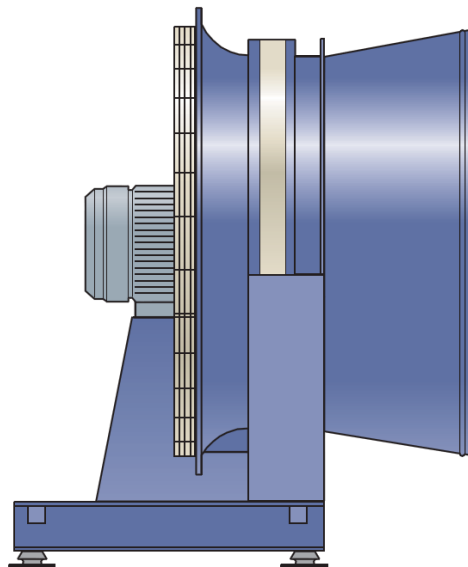
Pressure rise: Up to 3000 Pa.

The fans have completely stable flow and pressure characteristics which eliminates the risk of surging.

The AXICO ANTI-STALL® fans are used for comfort ventilation and for process ventilation and it meets the industrial requirements and can be adapted to meet specific requirements regarding materials, surface treatment, design, etc.

- Good operating economy
- Surge-free operation
- Good control economy - the fan blades are instantly set to meet the flow requirements of the installation, without impairing the high efficiency
- Choice of suitable hub diameter and blade angle for optimum matching to the desired operating point
- Standard 4-pole or 6-pole foot-mounted motor or two-speed motor
- Low vibration level
- Low mass-moment of inertia - short starting time
- Short overall length
- Complete range of accessories
- Surface treated with 80-micron coat of alkyd paint

The FPAC-1 axial-flow fan with a compact design guide vane diffuser



Air flow	3 - 110 m ³ /s
Pressure rise	0-3000 Pa
Temp. range	-15 to +40°C with regard to the insulation class of the motor

Applications

Comfort ventilation

Air handling units with AXICO ANTI-STALL® fans are used principally in hospitals, offices, hotels, exhibition halls, sports arenas, shopping centres and similar buildings.

All efforts are being made to achieve maximum compactness of conventional modular air handling units, in order to minimize building costs and space requirements.

The AXICO ANTI-STALL® CD range of fans has been developed specifically for such air handling units. CD stands for compact design. To make the fan as compact as possible, the guide vane section is integrated with a diffuser. The CD converts dynamic pressure into static without adding the length of a separate diffuser.

Its short overall length makes the AXICO ANTI-STALL® CD fan eminently suitable for all air handling units.

Process ventilation

What we normally recognize as process ventilation is the type of ventilation used in industrial plants, power stations, mines, paint shops clean rooms, offshore installations, garages and so on. Common criteria of all these plants are the strict demands as to factors such as reliability, resistance to corrosive environments (temperature, humidity), stable operating characteristics, spark-proof design and control accuracy.

AXICO ANTI-STALL® fans usually meet the industrial requirements and can be adapted to meet specific requirements regarding materials, surface treatment, spark-proof design, special motors, special designs, etc.

For particulars of the special variants available, consult your nearest Howden representative.

Design

The fan is supplied as a complete unit consisting of a casing with stabilizing ring, guide vane assembly, impeller, blade pitch control mechanism, guard, motor to IEC standard, and motor stand. Anti-vibration mountings of high damping rubber type and a flexible duct of PVCcoated nylon fabric for connection to an outlet duct are supplied.

In arrangement 6, the fan is also supplied with a flexible duct on the suction side. The unique stabilizing ring controls and stabilizes the turbulence occurring in a heavily throttled fan. An axial fan without this stabilizing ring would be forced to surge, which may eventually lead to material fatigue and operation disturbances.

The fan is available in two versions:

FPAC

The blade angle is controlled by a diaphragm motor located in the hub of the impeller. The diaphragm motor is pneumatically actuated by means of a positioner.

The FPAC offers accurate control of the blade angle, combined with fast response.

The positioner operates with a pneumatic input signal or with an electric input signal as an option.

FPMC

The blade angle is controlled by an electromechanic actuator operating on a control lever. The actuator is an accessory which, when ordered simultaneously with the fan, is fitted to the outside of the casing.

Materials and finish

The main components of the impeller (hub, blades, etc.) are made of cast aluminium alloy. The control disc is made of cast iron. Other components of the fan, such as casing, stand, fasteners, shafts, etc., are mainly made of steel.

The fan is painted with an 80-micron thick coat of blue alkyd paint. The fasteners are galvanized.

Environmental class C1, ISO 9223

Fans to higher environmental class up to and including C4 are available to special order.

Installation

The fan is to be mounted on the supplied anti-vibration mountings which are secured to the floor. Instructions are submitted with the fan.

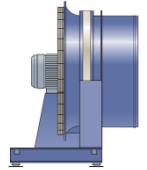
Packaging

The fan is delivered on a pallet, and is protected with plastic sheeting.

Arrangements available

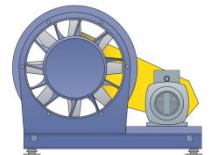
Arrangement 1

The fan impeller is mounted directly on the motor shaft. This is a compact arrangement which is particularly suitable for air handling units.



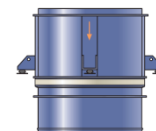
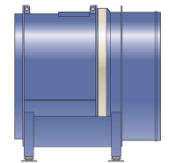
Arrangement 3

The impeller is belt-driven for high total pressure capacity. The motor is slidably mounted on a base frame, which makes the belt tension easy to adjust. The belt drive is provided with a galvanized steel guard.

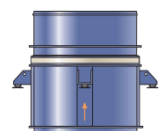


Arrangement 6

The impeller is mounted directly on the motor shaft. This arrangement is intended for connection to ducting on both sides. The FPAZ-21 inlet is used for open-suction installation. The fan can also be installed vertically.



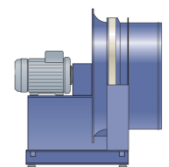
Vertical with upward direction of air flow



Vertical with downward direction of air flow

Arrangement 7

The impeller is mounted on an intermediate shaft connected to the motor by means of a highly elastic flexible coupling. The intermediate shaft is journalled in two bearing blocks. Grease nipples for periodic lubrication of the bearings are provided on the outside of the fan and are easily accessible. The motor can easily be replaced without the impeller and control components being disturbed.



Ordering key

Axial flow fan (see note)

FPAC-a-bbb-c-d-e-f

Axial flow fan (see note)

FPMC-a-bbb-c-d-e-f

When placing the order, please state the max. blade angle in text (see point 11, page 11)

Type

AC = pneumatic control
MC = mechanical control

Arrangement (a)

- 1 = Impeller mounted on motor shaft
 - for FPAC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 125-8-d-e-f
 - for FPMC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 125-8-d-e-f
- 3 = For belt-drive (belt drive to be ordered separately)
 - for FPAC, FPMC 080-5-d-e-f
090-6-d-e-f
100-6-d-e-f
112-8-d-e-f
- 6 = Ducted fan
 - Horizontal installation:
 - for FPAC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 180-6-d-e-f
112 up to and incl. 180-8-d-e-f ¹⁾
 - for FPMC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 125-6-d-e-f
 - Vertical installation: ²⁾
 - for FPAC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 180-6-d-e-f
112 up to and incl. 180-8-d-e-f
- 7 = Impeller mounted on intermediate shaft
 - for FPAC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 180-6-d-e-f
112 up to and incl. 180-8-d-e-f
 - for FPMC 080 up to and incl. 125-5-d-e-f
090 up to and incl. 160-6-d-e-f

Size (bbb)

080, 090, 100, 112, 125, 140, 160, 180

Hub diameter (c)

5 = 500 mm, 6 = 630 mm, 8 = 800 mm

Number of blades (d)

Number of blades on size/hub
8 = 8 blades on 080/5 - 125/5, 090/6 - 180/6
9 = 10 blades on 112/8 - 180/8

Motor size (e) ³⁾

0 = 132 S, M	5 = 250 M
1 = 160 M, L	6 = 280 S, M
2 = 180 M, L	7 = 315 S, M
3 = 200 L	8 = 315 L
4 = 225 S, M	9 = 355 S, M

Design (f)

2 = all except FPAC-6, vertical
3 = FPAC-6, vertical, upward air discharge
4 = FPAC-6, vertical downward air discharge

Guide vane diffuser, CD-version (for FPAC)

FPAZ-01-bbb-c

Guide vane diffuser, CD-version (for FPMC)

FPMZ-01-bbb-c

Diffuser, short (after CD guide vane diffuser)

FPAZ-02-bbb-c

Diffuser, long (after fan)

FPAZ-03-bbb-c

Air distributor ⁴⁾ (after fan)

FPAZ-04-bbb-c

Air distributor ⁴⁾ (after diffusers, see page 6)

FPAZ-05-bbb-c

Transition piece

FPAZ-06-bbb

(CD guide vane diffuser - air distributor)

Size = bbb in fan ordering key

Hub diameter = c in fan ordering key

- 1) Motor with angular contact bearings (for thrust loading on motor) for size/hub dia. 160/8 - 180/8
- 2) Motor with angular contact bearings (for thrust loading on motor) for upward direction of air discharge. FPMC will be quoted on request.
- 3) Check that the selected motor is included in the "Motors" table. See page 34.
- 4) If ordered separately, the air diffusers can be supplied in split condition to facilitate transport.

Inlet with protective grille (only for arr. 6)

FPAZ-21-bbb

Size = bbb in fan ordering key

Cylindrical silencer

FPAZ-24-bbb-c

Size = bbb in fan ordering key

Diameter of core (c)

0 = without core

5, 6, 8 = hub diameter = c in fan ordering key

Acoustic diffuser (with sound attenuation)

FPAZ-25-bbb-c

Size = bbb in fan ordering key

Hub diameter = c in fan ordering key

Flexible duct (for sound absorber)

FPAZ-33-bbb

Size = bbb in fan ordering key

Counterflange (for diffuser outlet) *

EBGA-a-bbb

Grouting-in frame (for diffuser outlet) *

EBGV-a-bbb

Materials and finish (a)

0 = unpainted, 1 = steel, painted

Size = bbb in fan ordering key, see * below

* NB. The outlet of FPAZ-02, 03 and -25 diffusers is two sizes larger than the fan connection.

Actuator

FPMZ-07-b

Actuator

FPMZ-09-b

Actuator

FPMZ-13-b

See table on page 28

Electro-pneumatic positioner

FPAZ-14

Pressure control equipment

FPAZ-16-bb-c

Control range (bb): 05 = 0-500 Pa
10 = 50-1000 Pa
20 = 100-2000 Pa

Version (c): 1 = For one fan

2 = For two fans

Pressure control equipment

FPMZ-16-bb-c-d

Control range (bb): 05 = 0-500 Pa
10 = 50-1000 Pa
20 = 100-2000 Pa

Version (c): 1 = For one fan

2 = For two fans

Type (d): 1 = Increase-Decrease

2 = 2-10V DC

Flow measurement transmitter

FPAZ-17

For particulars of the measuring range, get in touch with your nearest Howden representative

Flow measuring tapping

FPAZ-18-bb

b = code suffix "a" in the fan code

Control equipment for air flow control

FPAZ-70-bb

Control range (bb): 05 = 0-500 Pa
10 = 50-1000 Pa
20 = 100-2000 Pa

Blade pitch indicator for FPAC

FPAZ-19

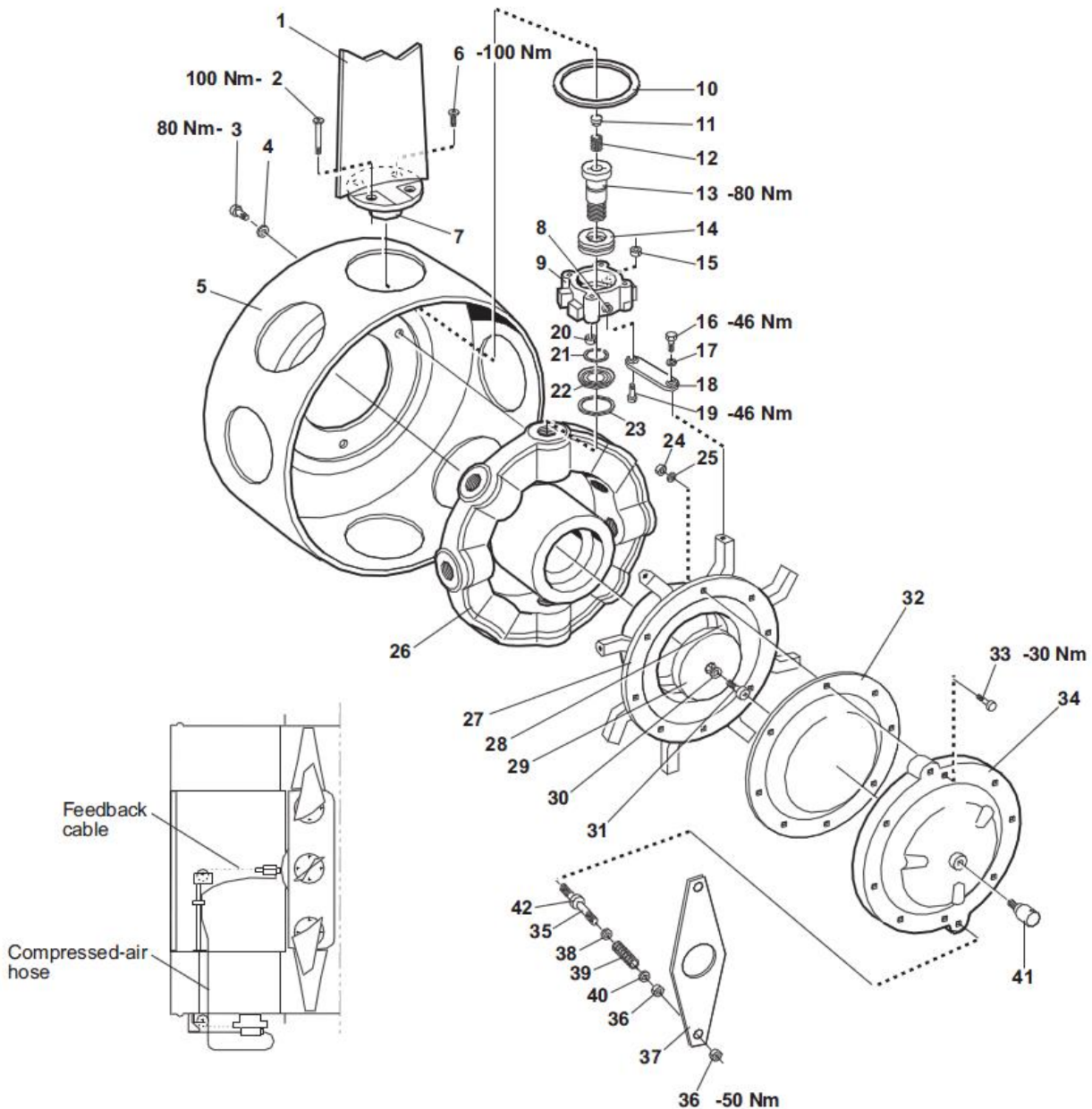
Blade pitch indicator for FPMC

FPMZ-19

Note

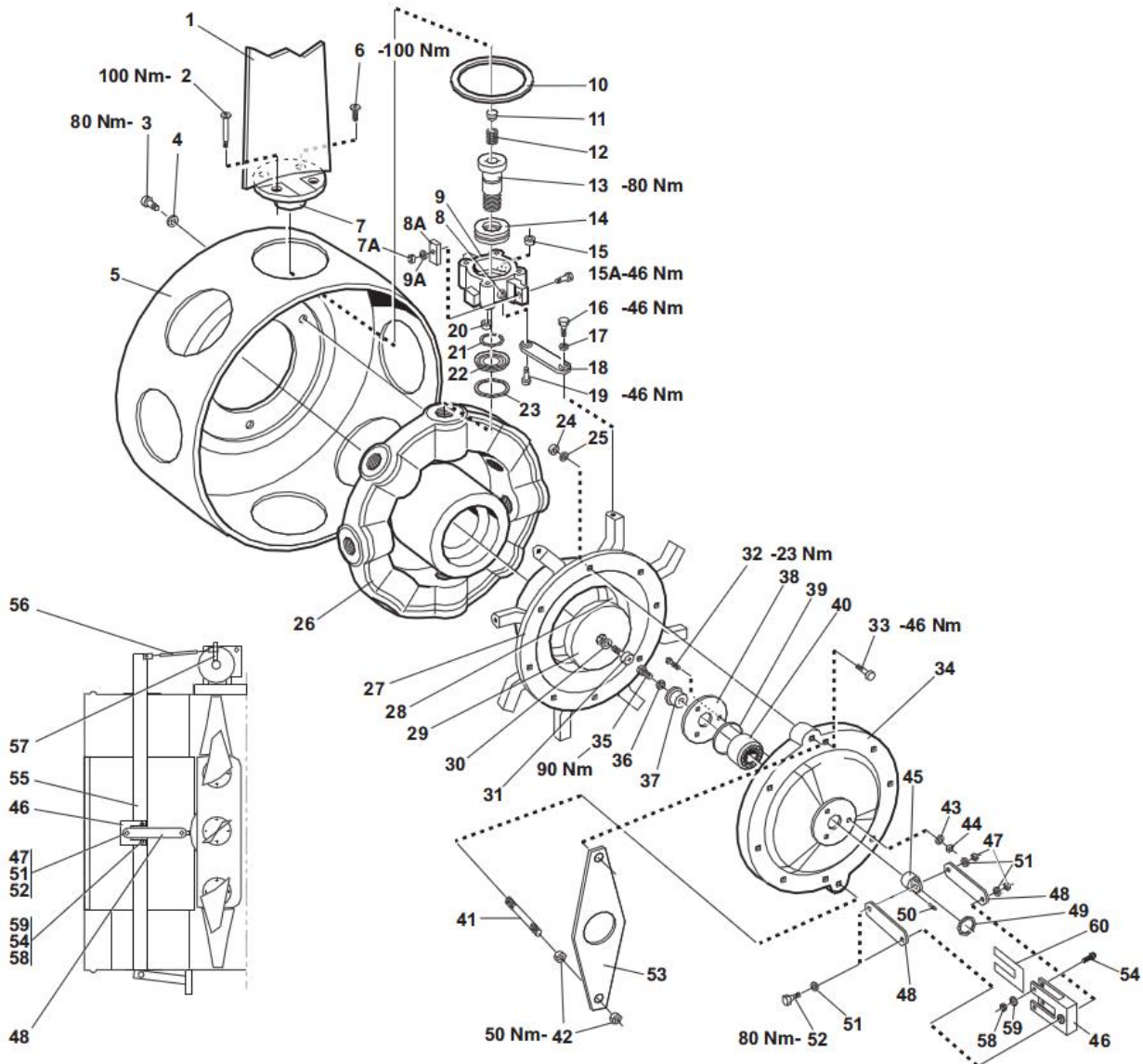
The motor should be specified separately as described on pages 34-39. The fans are designed for being driven by ABB motors, but a quotation can be submitted for equipping the fan with a motor of any other manufacture. However, if a different motor is selected, the order must always be accompanied by a drawing showing the dimensions of the relevant motor. In the case of arrangements 1 and 6, the outside dimensions of the motor must not be larger than those of the corresponding ABB motor, and the thrust-carrying capacity of the bearings must not be lower. For arrangements 1 and 6 the outside dimensions of the motor must not be larger than the hub diameter of the corresponding fan, since the fan performance may otherwise be affected. This applies to motor sizes IEC 225, 250 and 280 for hub diameters 5, 6 and 8 respectively. For arrangement 6, sizes 280 and larger motors must have permanently connected cables without terminal box in accordance with Howden drawing no. V 2508656.

FPAC impeller



- | | | |
|--------------------|------------------|------------------------|
| 1. Blade | 16. Screw | 31. Screw |
| 2. Screw | 17. Washer | 32. Diaphragm |
| 3. Screw | 18. Link | 33. Screw |
| 4. Washer | 19. Screw | 34. End cover |
| 5. Shield | 20. Nut | 35. Driver |
| 6. Screw | 21. Safety ring | 36. Nut |
| 7. O-ring | 22. Sealing ring | 37. Driver guide |
| 8. Grease nipple | 23. O-ring | 38. Washer |
| 9. Blade seat | 24. Nut | 39. Spring |
| 10. Sealing ring | 25. Washer | 40. Washer |
| 11. Peg | 26. Hub | 41. Rotary coupling |
| 12. Spring | 27. Control disc | 42. Minimum pitch stop |
| 13. Blade spindle | 28. Slide bush | |
| 14. Thrust bearing | 29. End disc | |
| 15. Nut | 30. Washer | |

FPMC impeller



- | | | | |
|--------------------|------------------|-----------------------------------|--------------------|
| 1. Blade | 15a. Screw | 33. Screw | 51. Washer |
| 2. Screw | 16. Screw | 34. Cover | 52. Screw |
| 3. Screw | 17. Washer | 35. Screw | 53. Driver guide * |
| 4. Washer | 18. Link | 36. Washer | 54. Screw |
| 5. Fairing | 19. Screw | 37. Bush | 55. Adjustment rod |
| 6. Screw | 20. Nut | 38. Cover | 56. Turn-buckle |
| 7. O-ring | 21. Safety ring | 39. O-ring | 57. Crank arm |
| 7a. Nut | 22. Sealing | 40. Control bearing | 58. Lock nut |
| 8. Grease nipple | 23. O-ring | 41. Driver | 59. Washer |
| 8a. Counter weight | 24. Nut | 42. Nut | 60. Washer |
| 9. Blade mounting | 25. Washer | 43. Washer | |
| 9a. Washer | 26. Hub | 44. Nut | |
| 10. Sealing | 27. Control disc | 45. Link arm bracket with bushing | |
| 11. Peg | 28. Slide bush | 46. Link arm with bushing | |
| 12. Spring | 29. End disc | 47. Nut | |
| 13. Blade spindle | 30. Washer | 48. Link arm | |
| 14. Thrust bearing | 31. Screw | 49. V-ring | |
| 15. Nut | 32. Screw | 50. Coupling | |

* Not fitted on certain variants



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