DETAILED ENGINEERING DESCRIPTION AND MECHANICAL FEATURES OF CONTINENTAL INDUSTRIE MULTISTAGE CENTRIFUGAL

BLOWER MODEL 031A

I - BLOWER HOUSING

The centrifugal blower housing consists of an inlet head with special feature to direct air to inlet of first impeller and outlet head of special design to eliminate friction and multiple intermediate sections. These parts are made in cast iron EN-GJL-250 (ASTM A48-35B) (for I/O heads) & cast aluminium (for intermediate sections) according to rigid Continental Industrie specifications, extreme care to be exercised in assembly of interlocking cast aluminium intermediate sections and annular diffusers (baffles).

The entire assembly is securely held together actually with multiple tension rods which bind the entire housing into a solid integral unit.

1.0 Inlet head

1.1 Flange connection DN 150, PN 10 (6”)

1.2 Cast iron EN-GJL-250 (ASTM A48-35B)

1.3 Minimum wall thickness: 8 mm (0.31”)

1.4 Can be supplied in various flange positions relative to the vertical centre line in increments of 90° (option)

2.0 Outlet head

2.1 Flange connection DN 150, PN 10 (6”).

2.2 Cast iron EN-GJL-250 (ASTM A48-35B).

2.3 Minimum wall thickness: 8 mm (0.31”)

2.4 Can be supplied in various flange positions relative to the vertical centre line in increments of 90° (option)

3.0 Intermediate section

3.1 Cast aluminium EN-AC-42000 (ASTM 360.1).

3.2 Each intermediate section is cast in one piece

4.0 Bearing housing

The outboard bearing housings are cast iron and bolted to the outside of the head sections insuring cool operation of bearings.

4.1 Cast iron EN-GJL-250 (ASTM A48-35B).

4.2 Has cast fins to improve rigidity and increase heat dissipation

4.3 Labyrinth type grease seal

4.4 Provided with 2 tapped holes in the housing flange to act as bearing puller.

N.B.: When the inlet air or gas temperature is too high, we can adapt as option special bearing housings with a water or air cooling system (technical drawing on request).

5.0 Bearings

5.1 The rotor assembly is supported by 2 heavy duty grease lubricated ball bearings, single row, sized to withstand the thrust load also type SKF or FAG.

5.2 Sized for minimum 10 years of operation (Direct Drive only), following SKF L10 bearing life calculation method.

5.3 Bearings are mounted in outboard type bearing housings and located so that bearings may be serviced without disassembling the blower casing or piping.

6.0 Shaft

6.1 C35 (AISI 1035) carbon steel shaft, straightened and stressreleved

6.2 Shaft is ground all over

6.3 Stiff shaft design to minimize vibration

6.4 The diameter of the shaft end is 45 mm (1.77”)

7.0 Shaft seals

7.1 Shaft sealing is accomplished using graphite ring seals or carbon ring seals.

8.0 Impellers

8.1 The impellers are in cast aluminium, in EN AC-43100 (AISI 360.1).

8.2 For minimum corrosion all aluminium alloys are non copper alloys

8.3 The outer diameter of the impeller is 610 mm (24”)

8.4 Each impeller is automatically sanded or shotted when leaving the foundry before the machining

8.5 Each impeller is statically balanced.

8.6 Impeller tip speed: 114 m/sec (374 FPS) at 3600 rpm.

8.7 First critical speed (9 stages) 3747 rpm.

8.8 Impeller assembly: to consist of a heavy steel shaft accurently machined and one or more aluminium alloy cast impeller(s), statically balanced, securely keyed to shaft and held in place by lock washers and locknuts.

9.0 Casing assembly

9.1 Vertically split assembly

9.2 Heads and sections have machined male and female joints to maintain concentricity

9.3 Entire casing is retained together with ø 20 mm O.D.

9.4 Joints are made gas tight with silicone sealant with following characteristics:

Viscosity	pasty mastic glue
max. space [mm]	6
Setting time	10 mn - 24 h
Shearing's resistance [DAN/cm²]	33
Break's resistance [DAN/cm²]	8
Max. temperature of use [°C]	-60 +260
Specific weight	1,06 at 25 °C
Hardness	35 SHA
Extension	460 %

10.0 Rotor assembly

10.1 Impellers, spacer are assembled on the shaft with a push to light press fit requiring little or no heat

10.2 Impellers, spacers are held together axially by a conventional locknut assembly

10.3 All impellers are keyed to shaft using a staggered key arrangement.

10.4 The impeller hub is fitted with a shrunk to pre-stress the bore and minimize rubbing. This also eliminates the relative thermal expansion and contraction since hubs and shaft are manufactured with different materials.

10.5 The rotor assembly is dynamically balanced on a computerized balancing machine

11.0 Lubrication system

11.1 The bearing housings are grease lubricated (see detailed description in installation, use & maintenance manual).

12.0 Recommended maximum allowable Piping forces and moments on blower connections

12.1 Inlet flange

FX = 30 KG	**FY** = 75 Kg	**FZ** = 60 Kg
MX = 45 kgm	**MY** = 22 kgm	**MZ** = 22 kgm

12.2 Outlet flange

FX = 30 KG	**FY** = 75 Kg	**FZ** = 60 Kg
MX = 45 kgm	**MY** = 22 kgm	**MZ** = 22 kgm

where :

F = force **M** = moment

X = Axial - parallel to rotor centre line

Y = Vertical

Z = Horizontal - normal to rotor centre line.

13.0 Vibration and noise

Vibration tolerance: 4,5 mm/s RMS

Vibration shall not exceed 4,5 mm/s RMS when measured in the vertical plane at the bearing housings with the blower operating at the design speed.

Sound level: please refer to the calculation data sheet

II - PERFORMANCES

1. All tests if required are in conformity with ASME Power Test Code.
2. For constant speed blowers:
   - The head shall be within the range of 100% - 105% of the normal head at design capacity,
   - The horsepower based on measured head shall not exceed 107% of the value at the specified normal operating point.
3. For variable speed machines:
   - through the rotational speed, the head shall be adjusted as close as possible to the design point, with zero negative tolerance,
   - the horsepower at that point shall not exceed 104% of the predicted shaft power value.