

**ROBOX Turbo | Technical Description****ROBOX**   
**TURBO**

<b>Description</b>	<b>Created By</b>	<b>Approved by</b>	<b>Date</b>	<b>Rev.</b>
General revision	Russell Frost	Saverio Mattucci	28/02/2022	2.1

## ROBOX Turbo | Technical Description

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## ROBOX Turbo | Technical Description

### 1.0 Airend

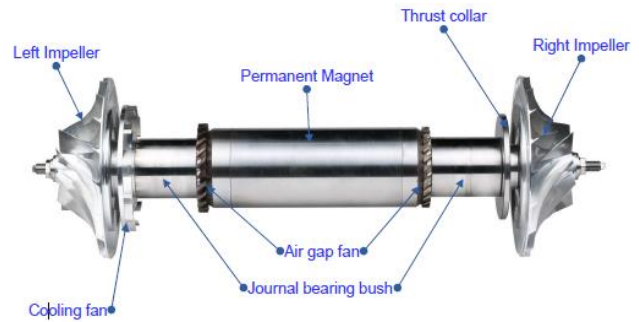


- Dynamic Centrifugal Rotary Blower for oil free atmospheric air
- Single or Twin Cast Impellers, with 5 axis dynamically balancing manufactured from cast aluminum AL7075-T651
- Casing with integrated air cooling jacket comprising of a mid-section and impeller volute, manufactured from cast aluminum AC4C –T6
- Single shift with integrated cooling fans manufactured from machine stainless steel TC4
- Double acting multi-foil air bearings providing lateral and axial support. Made from Inconel Alloy x-750
- Twin labyrinth seals mounted at each end of the shaft.

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**2. Drive Shaft & Bearing**

**2.1 Drive Shaft**

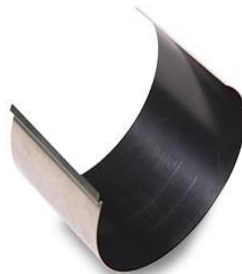


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- Manufactured and machined from SUS420-JS stainless steel in single or twin impeller versions, supported by twin multi-foil air bearings.

**2.2 Multi-Foil Air Bearings**

- The drive bearing assemblies are of multi-foil air bearing and are Aero-dynamic in design
- The combined bearing is designed to with stand both radial and axial Loads and is manufactured from Inconel X-750 Alloy
- With a protective and anti-abrasive 2-Stage Teflon coating.
- Excellent stability at both high and low speeds, and is self-positioning
- 100% oil free by design



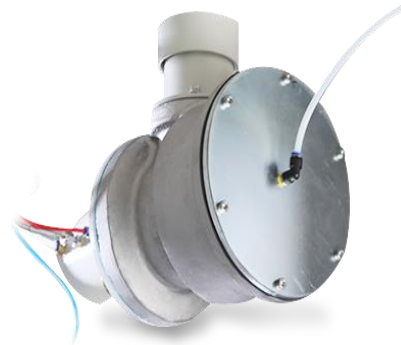
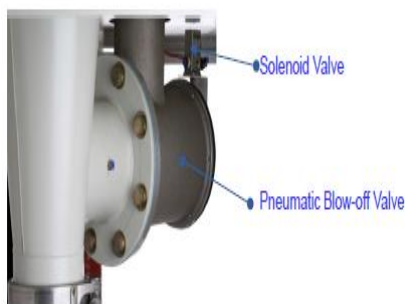
**ROBOX Turbo | Technical Description**

**3.0 Check/ Non- Return Valve**



- Check/ Non –return valve fitted to outlet silencer to prevent the reverse rotation of the blower when used in multi-blower operations
- Manufactured from powder coated stainless steel
- Single shaft “ butter-fly” design
- Designed to operate in temperatures >200DegC
- Available as “disc insert” or flanged design - DIN150-500

**4.0 Pressure Relief Valve / B.O.V**

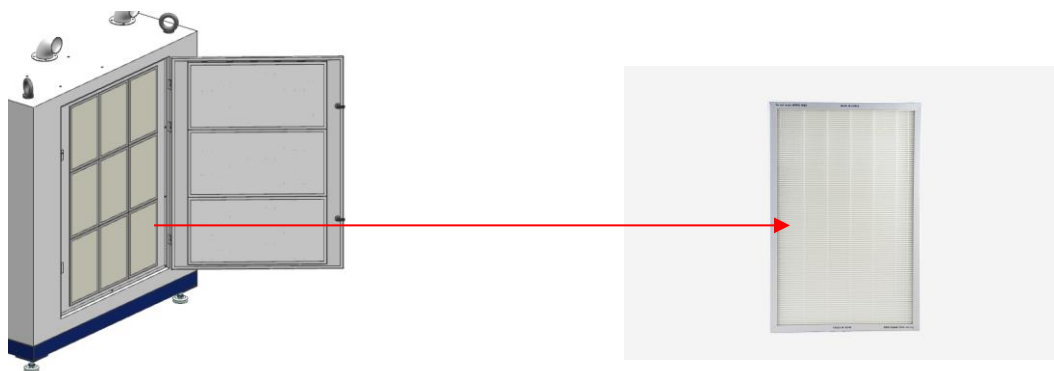


- Integrated safety valve with rubber diaphragm and stainless steel spring assembly
- Electro -pneumatically operated with an externally mounted silencer
- Required to equalize the system pressure during the starting/ stopping procedure of the blower
- Incorporates safety shutdown feature in the event of an over pressure situation
- The valve is controlled by the blower PLC/ HMI controller with adjustable parameters of up to 10%

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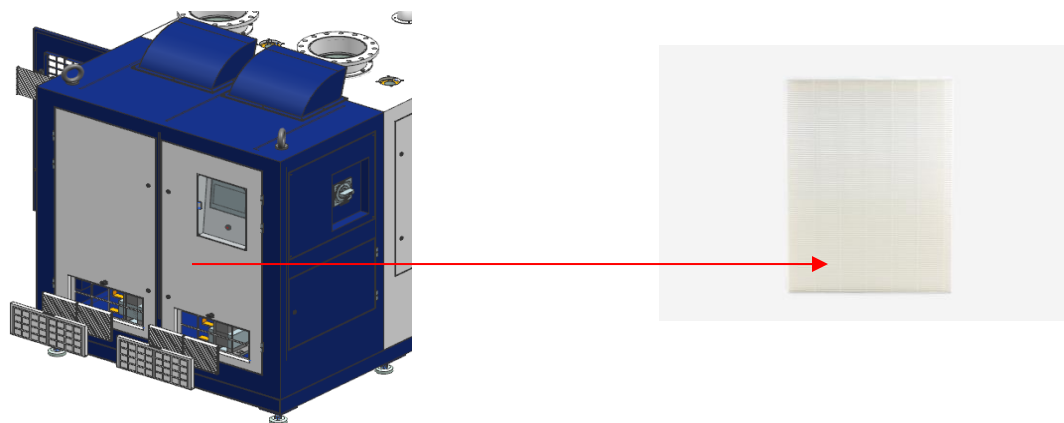
### 5.0 Process & Cooling Air Filters

#### 5.1 Mechanical Cooling & Process Air Filters



- Two stage system manufactured from Paper/ Polyester Spun Bound ( non-woven) Material
- 5.0micron filtration
- Efficiency rating 91.2%
- Grade G4 / ASHRAE 521./ 52.2 in accordance with EN779

#### 5.2 Electrical Cabinet Cooling Air Filters



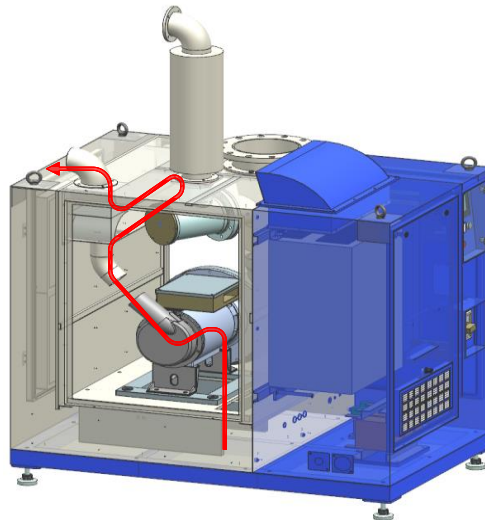
- Single stage manufactured from Paper/ Polyester Spun Bound
- 5.0 micron filtration
- Grade G4 / ASHRAE 521./ 52.2 in accordance with EN779

## ROBOX Turbo | Technical Description

### 6.0 Air Intake & Motor Cooling Air Discharge Silencers



- Integrally fitted inside each acoustic canopy
- Dedicated flow path for efficient cooling and reduce noise
- Resonance in design
- Diffuses turbulent air, increasing overall efficiency and reducing noise levels



## ROBOX Turbo | Technical Description

### 7.0 Acoustic Canopy

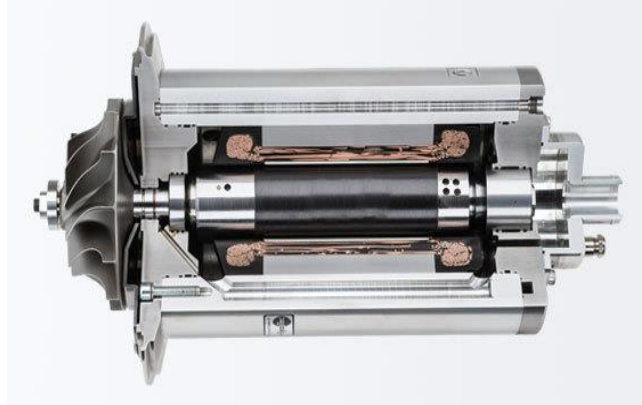


- Soundproof enclosure, modular in design and consisting of independent electrical and mechanical sections. Manufactured from SS400 zinc plated hot rolled steel. Insulated with non-woven rock wool fire resistant fibre ( ISO 3795)
- Dedicated air flow ducting for effective high efficiency cooling
- 2 stage powdered coating
  - Electrical Cabinet & Base Frame. Blue( RAL 5003)
  - Mechanical Cabinet. White ( RAL 9003)
- Adjustable feet for easy installation- with locking device
- Inverted rubber door seals to ensure air tight operation
- Ventilation grills with dedicated air filters
- IP54 by design ( IP55 version available for our door applications)
- Auxiliary cooling fans in electrical cabinet , 400v/ 3ph/ 50 or 60hz
- Removable doors for easy inspection and maintenance
- Inlet Silencer for low vibration and reduced sound levels of <80dba ( ISO3744)



## ROBOX Turbo | Technical Description

### 8.0 Electric Drive Motor



- High efficiency air cooled high speed Permanent Magnetic Synchronous Motor ( PMSM)
- Casing manufactured from cast aluminum AC4C-T6
- Stainless steel shaft with Nickel Chromium Electro-Magnets
- Power Supply 400v +/- 10% at 50 Hz and 460v +/-10% at 60Hz ( 2pole |)
- Certified for CE, UL, CSA & EAC applications
- Direct drive
- Operating speeds from 19,000 to 42,000rpm
- Rated to IP55 temperature class B
- Insulation to class H
- Service factor 1.2
- Twin PTC sensors
- Suitable for VFD applications 380-460v/ input frequency 45-66Hz
- Supplied with base frame and electrical connection panel.

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9.0 Variable Speed Drive



- Each blower is supplied with a high efficiency air cooled IP65 rated integrated VFD either
  - Yaskawa (< 250hp) or VACON (>250hp)
- Low emission by design with integrated harmonic-EMC filtration
- AC choke with operating range of 380-500v / 45-60 | Hz
- Frequency control U/f, open loop sensor less vector control with closed loop vector control option
- Braking torque DC brake 30%
- Analogue input voltage +10 (-10v ...+10 control), Ri=200 k $\mu$
- Digital inputs 6x positive logic 18-30 VDC
- Operating temperature range -10 to +40 Deg C
- Relative humidity 0-95%, non-condensing/ non-corrosive water
- Air quality to IEC60721-3-3, AC drive in operation class 3C2 & IEC 721-3-3 AC drive in operation class 3S2
- Vibration to IEC/EN 60068-2-6 & IEC/EN 61800-5-1
- EMC level C: EN61800-3 category C1, C2 & C3
- Certification to IEC/EN61800-5-1. CE, UL, cUL and RCM
- Safety testing to IEC 60664-1 and UL840. Category III

## ROBOX Turbo | Technical Description

### 10.0 Instrumentation



- Each blower is supplied with intergrated PLC, 7" touch screen HMI control and communications package
- Data displayed includes :
  - suction and discharge pressure
  - inlet and output temperature
  - operating pressure
  - motor speed and air flow
  - power consumption
  - alarms, air filter pressure differential and maintenance alerts
- HMI display TFT colour LCD. 32K colour 65,536 blinks with 2.5M byte memory
- DC24v +/-10% with lithium batttry back-up
- Operating temperature of 0- +50 Deg C and 85% RH. Rated to IP65
- Tested to standard CE,KC UL61010-1-2-201
- X8i series PLC. 60k steps. 8DC IN/ 6 TR OUT with 4 channel HSC & 6 channel PTO
- SD card supported
- RS232c/485 high speed serial ports
- Built in Ethernet/IP support module with Modbus TCP protocols. 100BASE TX and 10BASE-T enabled UTP cable
- Data rate 10/100Mbps. TCP/IP and UDP/IP compatible – 16 connections
- RTC ( real timeclock) function
- CPU unit including 2x RS232C/485 selectable ports and additional USB
- RoHS compliant

## ROBOX Turbo | Technical Description

### 11.0 Accessories

#### 11.1 Discharge Silencer

- Externally mounted absorption type outlet silencer
- Manufactured from mild steel with an anti-corrosive coating
- Can be installed vertically or horizontally
- Sound reduction of up to 20dBA
- Available for TS20-TS700 models



#### 11.2 Flexible Coupling

- Flanged flexible coupling
- Stainless steel in construction
- Reduces vibration and prevents noise attenuation
- DIN 80A – 500A



#### 11.3 Flange Elbow Joint

- For the installation of the discharge silencer in the horizontal position
- Mild steel with welded flanges
- DIN 80A – 500A

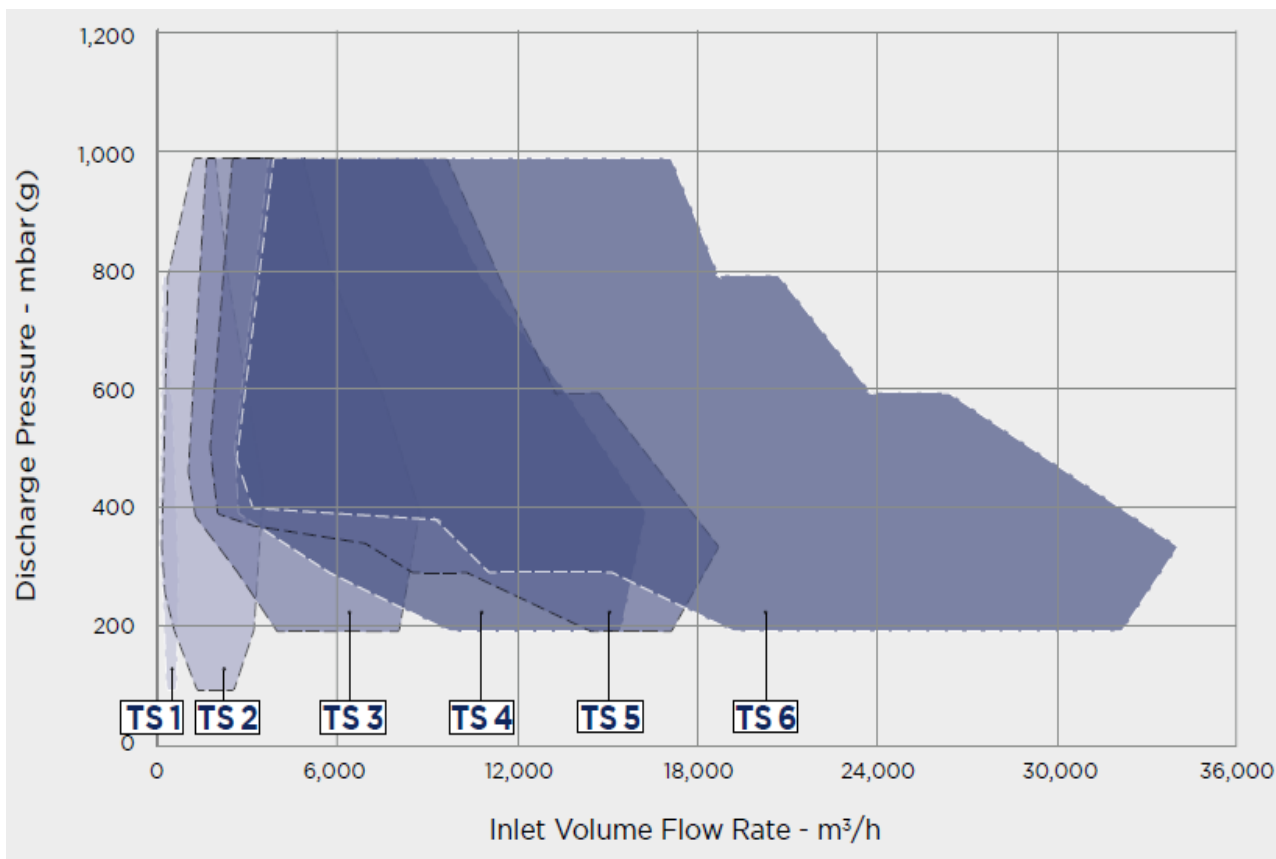


**Note: All accessories are supplied with bolts, washers, nuts and gaskets**

## ROBOX Turbo | Technical Description

### 12. Performance, Weights & Dimensions

#### 12.1 Performance



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### 12.2 Weights & Dimensions (IP 54 Version)

Robox Turbo Frames	POWER			W mm	D mm	H mm	Weight kg	DN
	Hp	/	kW					
TS 1	10	/	7.4	800	1200	1350	390	80
TS 2	20	/	14.7	800	1200	1350	415	150
	30	/	22.1				510	150
	50	/	36.8				540	150
	75	/	55.2				920	1450
TS 3	100	/	73.5	1020	1700	1900	870	250
	125	/	91.9				870	250
	150	/	110.3				900	250
	200	/	147.1				950	300
TS 4	250	/	183.9	1300	2000	1900	1400	350
	300	/	220.6				1480	350
	350	/	257.4				1500	350
TS 5	400	/	294.2	1700	2500	2040	2200	400
TS 6	500	/	367.7	1800	3500	2200	3700	500
	600	/	441.3				3860	500
	700	/	514.8				3900	500

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### 13.0 Blower Frame Sizes

**TS/1**

**10 Hp  
(7.5 kW)  
650x650x h1020  
DN80**

**TS/4**

**250-300-350 Hp  
(184, 220 & 260 kW)  
1300x2000x h1900  
DN350**

**TS/2**

**20-30-50-75 Hp  
(15, 22, 37 & 55 kW)  
920x1450xh1500  
DN150-DN200**

**TS/5**

**400 Hp  
(295 kW)  
1700x2500x h2040  
DN400**

**TS/3**

**100-125-150-200 Hp  
(75, 90, 110 & 145 kW)  
1020x1700x h1900  
DN250-DN300**

**TS/6**

**500-600-700 Hp  
(367,440 & 520 kW)  
1800x3500x h2200  
DN500**