The Highest Efficiency PMS Motor

Discovering a New Frontier with Turbo Blower Innovations

NAMWON TURBOONE

Since 1995

History

Oct	1995	· Established Namwon Inc.
Oct	1997	· Awarded the $10 Million Export Tower Trophy at the 34th Korea Trade Day
Jul	2003	· Established a joint venture sales company in Beijing, Qingdao, and Taiwan
Mar	2012	· Established a fully invested corporation (branch office) in Qingdao, China
Sep	2012	· Started production and sales of Namwon Turbo One turbo blowers
Jan	2015	· Established the first factory in Hwasun, Jeonnam
Apr	2015	· Obtained ISO 9001, 14001 Certifications
May	2015	· Obtained Company-Affiliated Research Institute Certification (R&D)
Jun	2015	· Obtained Venture Business Certification
Nov	2015	· Obtained CE Certifications
Jan	2016	· Obtained High-Efficiency Equipment Certification
Dec	2016	· Established a new factory and moved headquarters to Naju, Jeonnam
Dec	2017	· Registered a patent for the motor cooling system (Patent Registration 10-1042422)
Feb	2018	· Obtained Technology Innovation-Orientated Small and Medium Enterprise Certification (INNO-BIZ)
Mar	2018	· Certified as a specialized company for material parts
Apr	2018	· Designated as a Global Hidden Champion
Aug	2018	· Obtained High-Efficiency Equipment Certification for 30HP, 50HP, 75HP, 100HP, 150HP, and 200HP
Oct	2018	· Obtained NRTL Certifications
Dec	2018	· Registered a patent for the balance device for air flow in the motor cooling system (Patent Registration 10-2073896) · Registered a patent for the auto balance device for air flow in the motor cooling system (Patent Registration 10-2112422) · Commendation from the President of South Korea at the 55th Korea Trade Day
Feb	2019	· Registered a patent for the temperature reduction in the air of the motor cooling system (Patent Registration 10-2146187) · Registered a patent for the turbo blower motor cooling system (Patent Registration 10-2110278)
Jun	2019	· Established a second factory in Naju, Jeonnam
Dec	2019	· Awarded USD 10 million Export award and commendation from the Ministry of Trade, Industry and Energy
Jan	2020	· Obtained UL Certifications
Mar	2020	· Registered a patent for the impeller (Patent Registration 10-2228675)
Oct	2020	· Established a third factory in Munpyeong, Jeonnam
Jan	2021	· Obtained ISO 13485 Certification

Certificates


High-Efficiency Equipment Certification


High-Efficiency Equipment Certification


High-Efficiency Equipment Certification


CE


Inno-Biz Certification for SME


Motor Cooling System Patent


Balance Device for Air Flow in Motor Cooling System Patent


ISO9001


ISO14001


KTP


NRTL


UL


ISO 13485


Impeller Patent

Namwon Turbo One

is a specialized manufacturer of high-performance turbo blowers.
We research, develop, manufacture and sell
the highest performance products by combining the best technology
in each field. Such as air bearings,
precision machined impeller, high-speed / high-efficiency
Permanent Magnet Synchronous Motor (PMSM),
inverter for control of high-speed motors,
automated control logic and system designs.

World's Leading Air-Bearing Turbo Blower Manufacturer

Namwon Turbo One is a specialized manufacturer of high-performance turbo blowers. We research, develop and incorporate the latest innovations in air bearings, precision machined impeller, high-speed / high-efficiency Permanent Magnet Synchronous Motor (PMSM), inverter for control of high-speed motors, automated control logic and system designs. Namwon Turbo One was established in 1995 and is a one-of-a-kind company.
Our company is expanding the blower market worldwide and has installed more than 3000 Turbo Blowers in 900 locations.

Key Features & Characteristics

High-Efficiency

- Saves up to 45% of energy compared to comparable blowers.
- Acquired a certificate of High Efficiency Equipment from Korea Energy Agency.

Low Maintenance

- No lubrication required as it uses air-foil bearings.
- Only need to replace the suction filter.

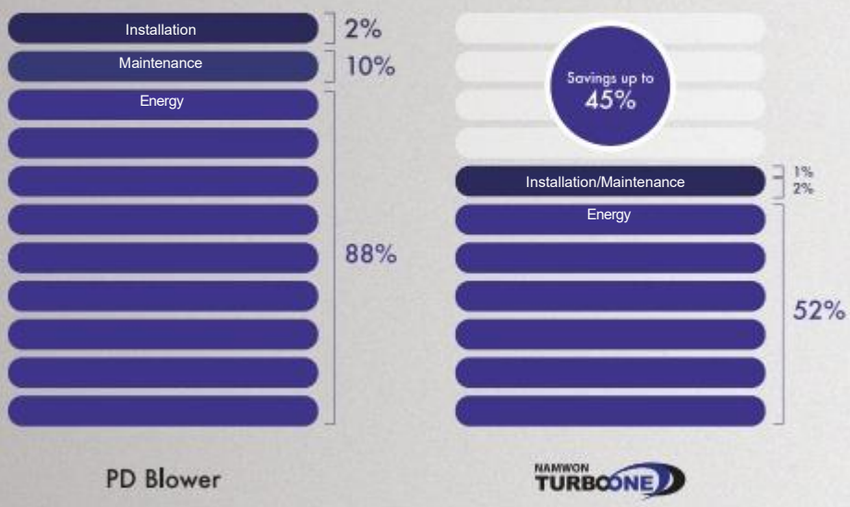
Vibration-Free / Low Noise

- No internal contact during operation allows for a vibration-free operation
- 75-80 dB of operational noise; thus, no additional soundproofing required.

Compact Size

- The size of our Turbo Blowers is only one third of PD Blowers.

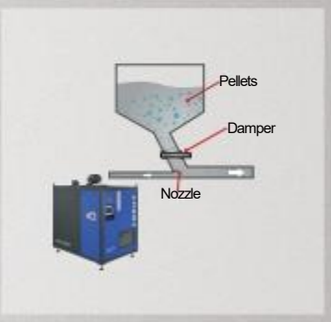
Cost Comparison



Exclusive Product with Variety of Uses

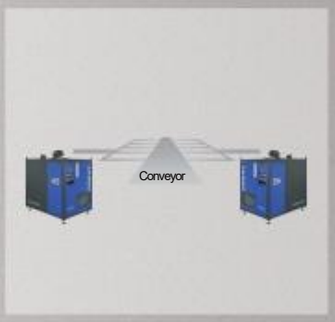
Water Treatment Facilities

Supply compressed air into the water tank to treat waste water and sewage. Dissolves oxygen in waste water (to multiply inorganic substance)

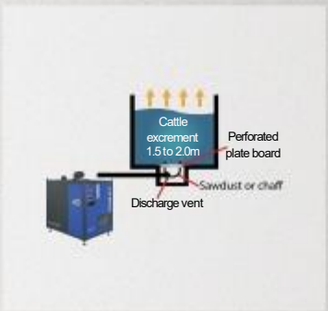


Pneumatic Transfer

Transfer powder materials for cements, chemical ingredients, sugar, etc.



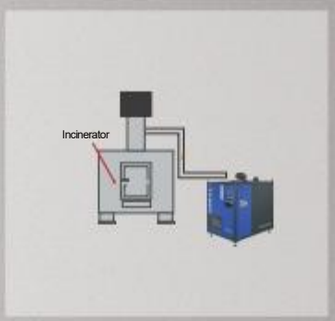
Dehumidification, drying & FGD (Flue-gas desulfurization)



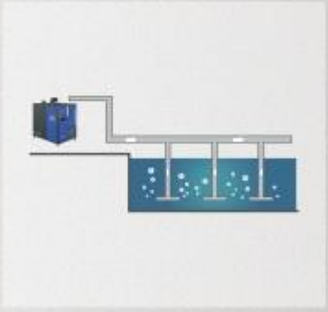
Compost Fermentation

Supply air to treatment facilities in the agricultural and livestock sectors.

Sand Blasting

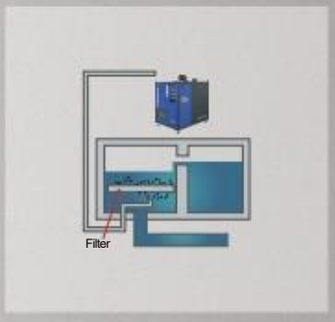


Incinerators



Oxygen Supply

Electroplating



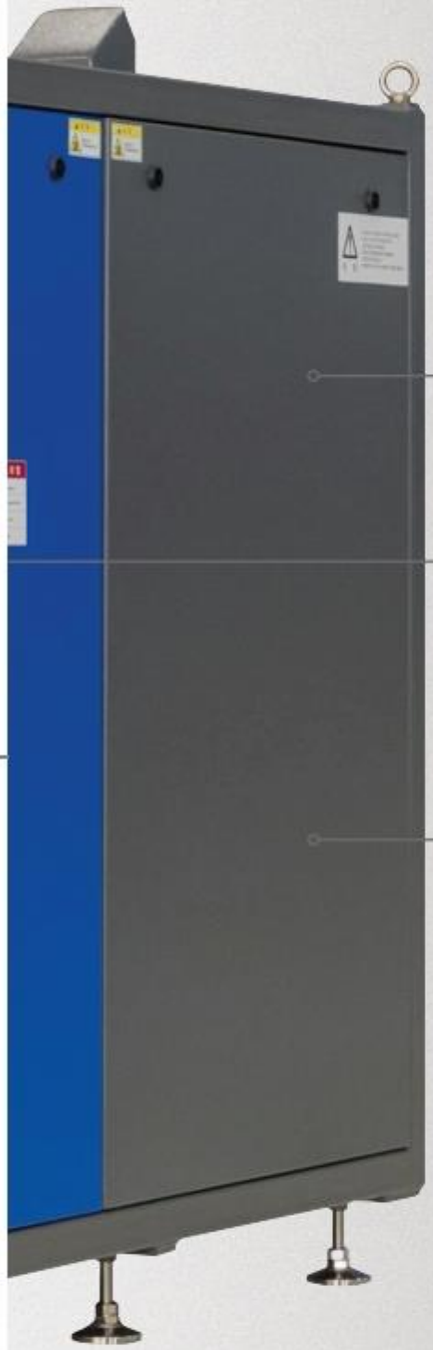
Back Washing

Turbo Blower Structure

Inverter

HMI

Main Filter



Standard filter type

Inlet flange type

BOV

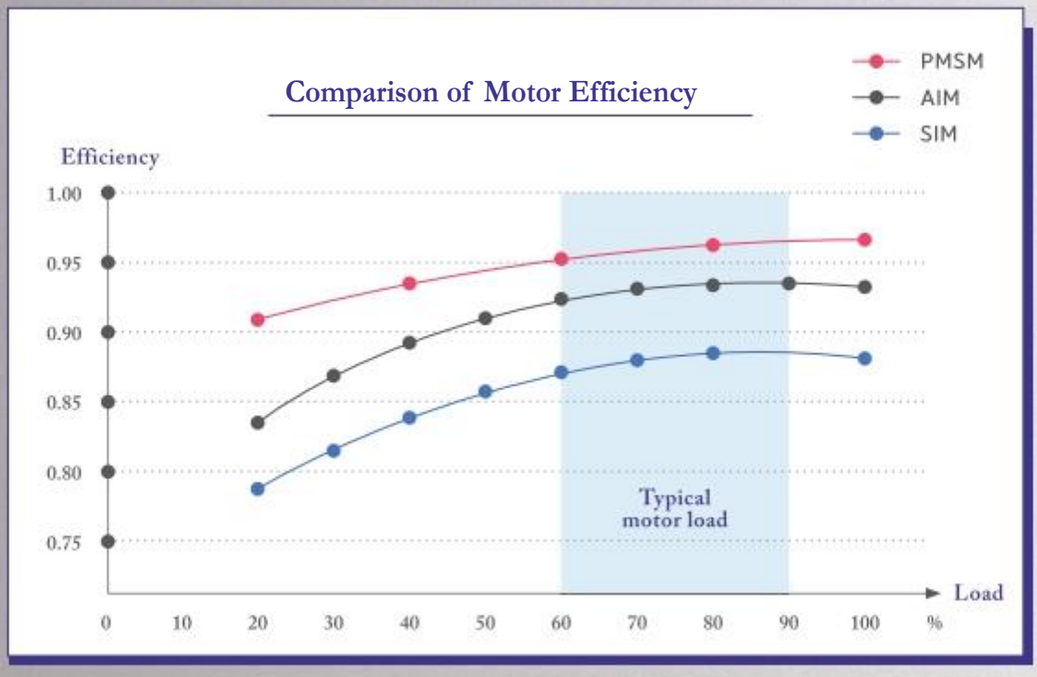
Control panel and
Circuit breaker

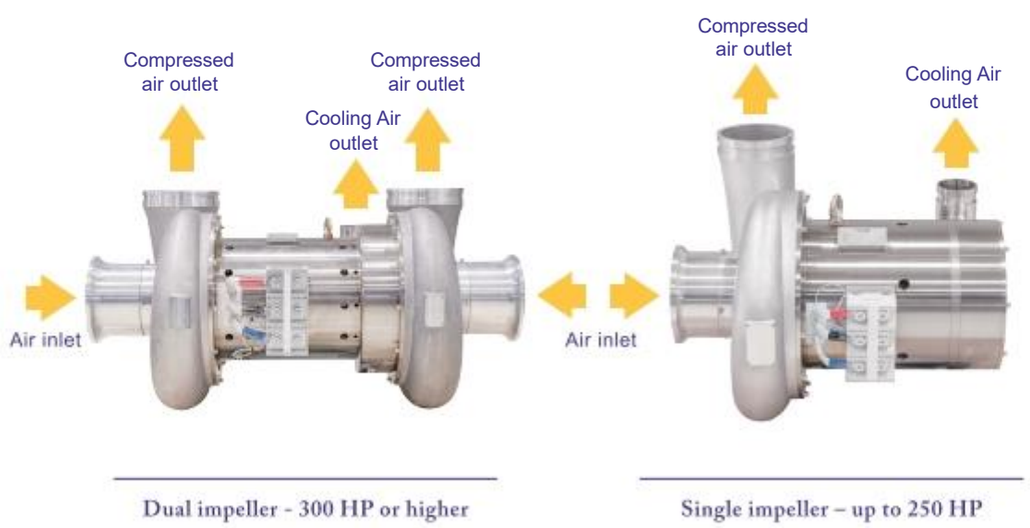
Motor core & Air-end

High-Efficiency, High-Speed Permanent Magnet Synchronous Motor (PMSM)

NAMWON TURBO ONE's PMS motors are optimized for high-speed rotation; minimizing current loss and delivering a maximum efficiency of 98%.

- No power loss due to direct drive
- Optimized design for high-speed rotation
- Rotates up to 120,000 RPM via a frequency inverter
- Efficient heat dissipating surfaces compared to other motors
- No need for separate start-up tool since start-up is 4.5% of the rated current
- Conducted approximately 100,000~120,000 start-stop tests
- High-speed PMS motor is significantly smaller than an induction motor
- Accurate control of speed





Dual impeller - 300 HP or higher

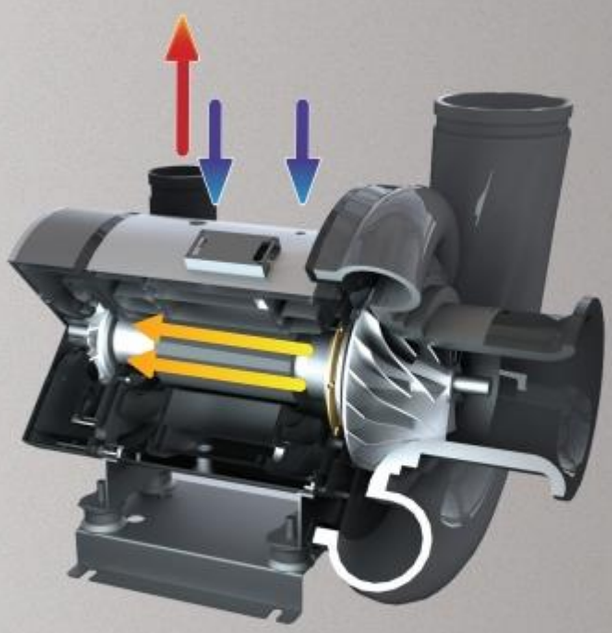
Single impeller – up to 250 HP

Cooling System

· Completely self-cooling system by the rotation of the cooling fan connected to the rotor. It draws in the ambient air to cool the motor.

· Our cooling system does not require any additional components like other cooling methods such as water cooling

· No maintenance is required



Air Bearing in Turbo Blowers

Air Foil Bearing

Contactless bearing is created when the shaft rotates at high speed; a wedge effect is created between the load of the rotating body and the shaft due to the compression force exerted by the high pressure of the air.

- Air bearings uses air as a lubricant, it is oil-less, contactless, and eco-friendly
- No maintenance is needed due to the simple structure without the need for lubricant
- A special coating is applied between the inner surface of the bearing and the rotor. This reduces the frictional wear that occurs during start-stop. It allows for a long and stable durability.

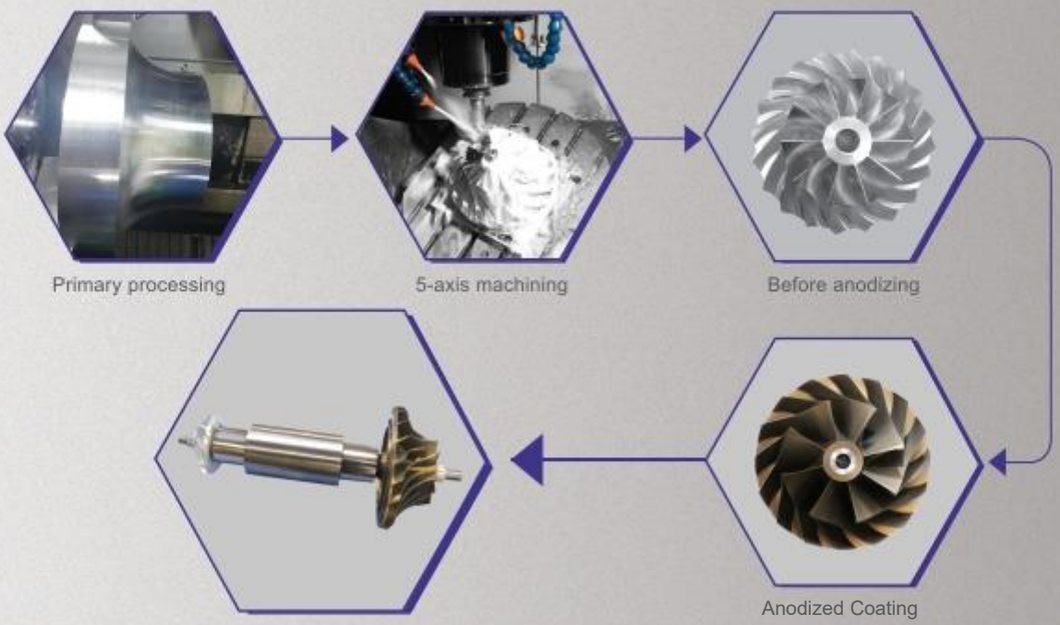
Comparisons of Different Bearings

	Section		
			
	Air Foil Bearing	Tilting Pad Bearing	Ball Bearing
Lubricant	Not required	Required	Required
Durability/Life	Semi-permanent	Semi-permanent	Needs replacement
Maintenance	None	Check once every 5 years	Replace after a certain period of operation
Reliability	20	1	1
System	Simple	Complex oil system (Pump, filter, decompression system, pressure sensor etc.)	

High-Efficiency, High-Precision Machined Impeller

Namwon Turbo One's impeller is manufactures with state-of-the-art aerodynamic system technology. It is the same technology used in aeronautical engineering. The impeller is sophisticated and precision machined to be highly-efficient.

- Precision design ensures a wide range of flow rate and surge margin
- Precision machined using 5-axix CNC ensures uniformity for all our products to maintain a high-efficiency
- High durability due to the use of high strength heat treated aluminum alloy (AA7075 T6)
- Surface strength is increased with anodized coating
- Direct connection to the shaft minimizes power transmission loss



High-Efficiency Inverter Optimized for High-Speed Rotation Motor

High-Efficiency Inverter

- Inverter with state-of-the-art energy saving technology
- Smaller motor start-up current compared to other inverters
- Reduce electricity rates with automated maximum efficiency operation
- Reduces ambient noise and suppresses electronic noise
- DC reactor internally suppresses harmonic level
- High-efficiency and reliability with 96% or more control efficiency due to a smooth start and precise operation
- Kinetic Energy Back-up (KEB) function can safely decelerate and stop the motor in case of power failure.
- Sensor-less technology prevents malfunctions at high temperatures.
- No additional startup control panel or facilities due to the start up current being less than 1%.
- 0.3% Unload Power Consumption
- Lightweight design

Comparison of Efficiency of Type of Blowers

	 Existing roots blower	 Gear type speed-increasin	 Namwon Turbo One TB50-0.8
Principle	Volumetric	Centrifugal	Centrifugal Turbo
Power transmission	V-belt	Booster Gear	Direct connection
Discharge pressure	0.8bar	0.8bar	0.8bar
Flow Rate	29m³/min	29m³/min	29m³/min
Power	55kW	48kW	35kW
Noise (@1m)	95-110dB	90dB	Less than 75-78dB
Vibration	Severe	Minor	No Vibration
Lubricant	Required	Required	Not required
Maintenance	Regular and complex	Regular and complex	Very simple (only regular air filter replacement required)

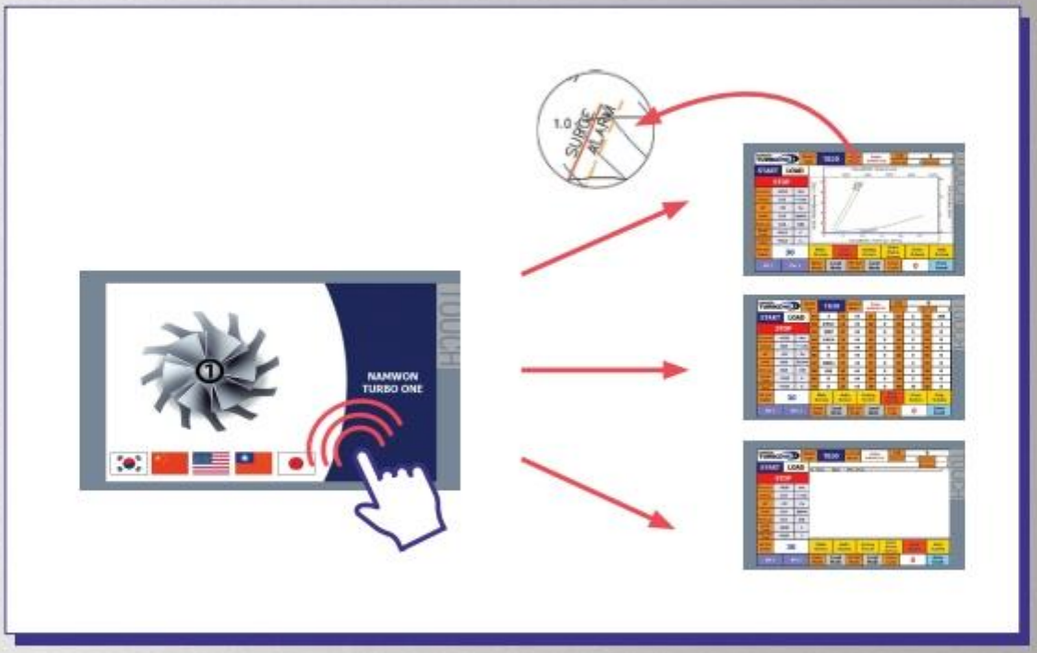
User-Friendly Control System

Use of premium PLC

- Precise and accurate control of the blower along with high stability
- Lower rate of malfunction due to electronic noise
- The control logic is optimized for high-speed blowers, it allows the user to control various inputs such as constant pressure, flow rate, and speed for operation
- Can be remotely controlled by Modbus RTU protocol via RS-485 serial port
- Reduces the possibility of power surges during operation of the blower through an anti-surge controller

Usage of HMI from a system-specialized company

- Real-time monitoring shows the information of the blower's operation such as flow rate, pressure, temperature and rotation speed through an HMI system on an LCD screen.
- Touchscreen displays and multi-language support allows for an easier operation.



Convenient Features of Namwon Turbo One's Turbo Blowers

Simple maintenance

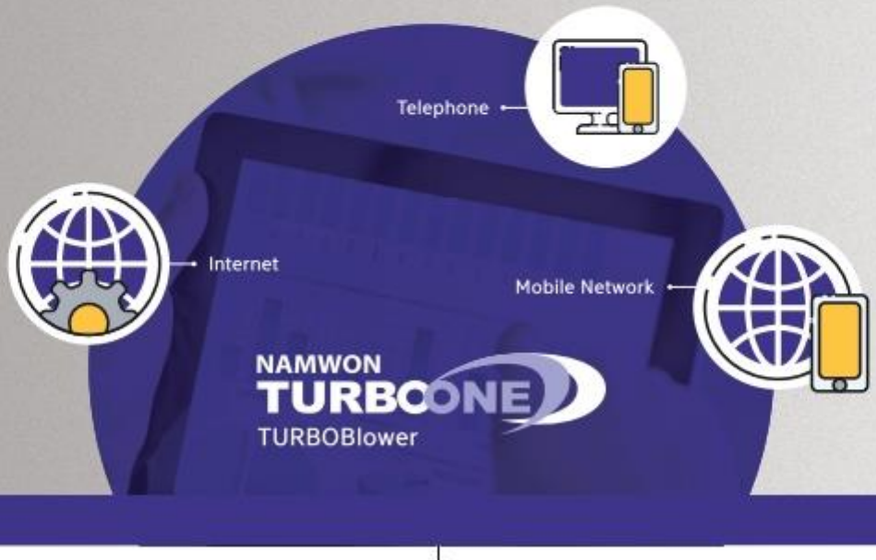
- Periodic maintenance is completed by removing the dirty filter and replacing it with a new one
- Dual filter structure (non-woven pretreatment filter + main filter) improves the quality of the compressed air
- Low pressure loss due to optimized design of the filter

Low noise low vibration

- The noise of the blower is as low as 75-80dB at 1m
- No need for any additional soundproofing
- Centrifugal blower allows for continuous suction and discharge
- The vibration of the product is minimal that it can be considered ZERO

Convenient remote control

- Real remote control is available with IIoT anywhere or anytime though various infrastructure such as telephone network, internet, and mobile network



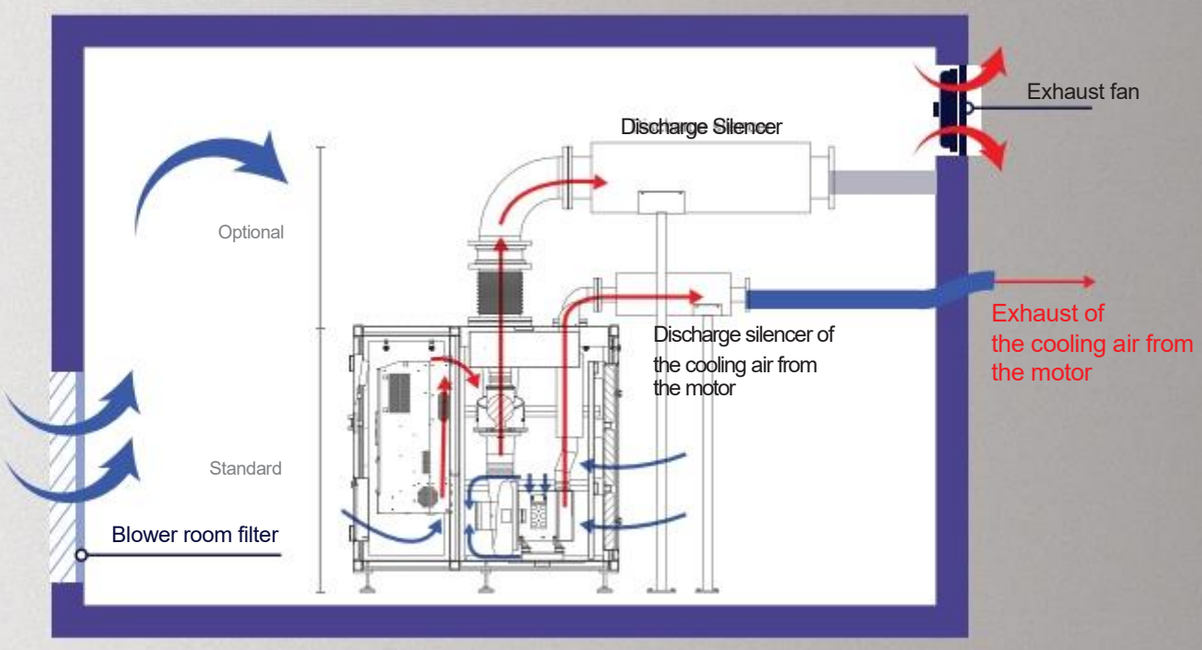
Blower Installation

Simple and easy installation (Plug & Play)

- No anchor of foundation is required due to minimal vibration
- Installation is completed by simply placing the blower at the desired location and connecting the power line and piping
- Complete the installation by leveling the blower; adjust the level foot at the bottom of the blower

Layout of recommended installation

- Optimized ventilation
- Insulate the discharge pipe of the compressed air, as it causes the temperature in the blower room to rise
- Ensure the exhaust air from the cooling the motor to go out of the blower room
- Order of installation of the pipe: Flexible Joint -> Check Valve -> Elbow -> Discharge silencer
- Refer to the installation diagram below

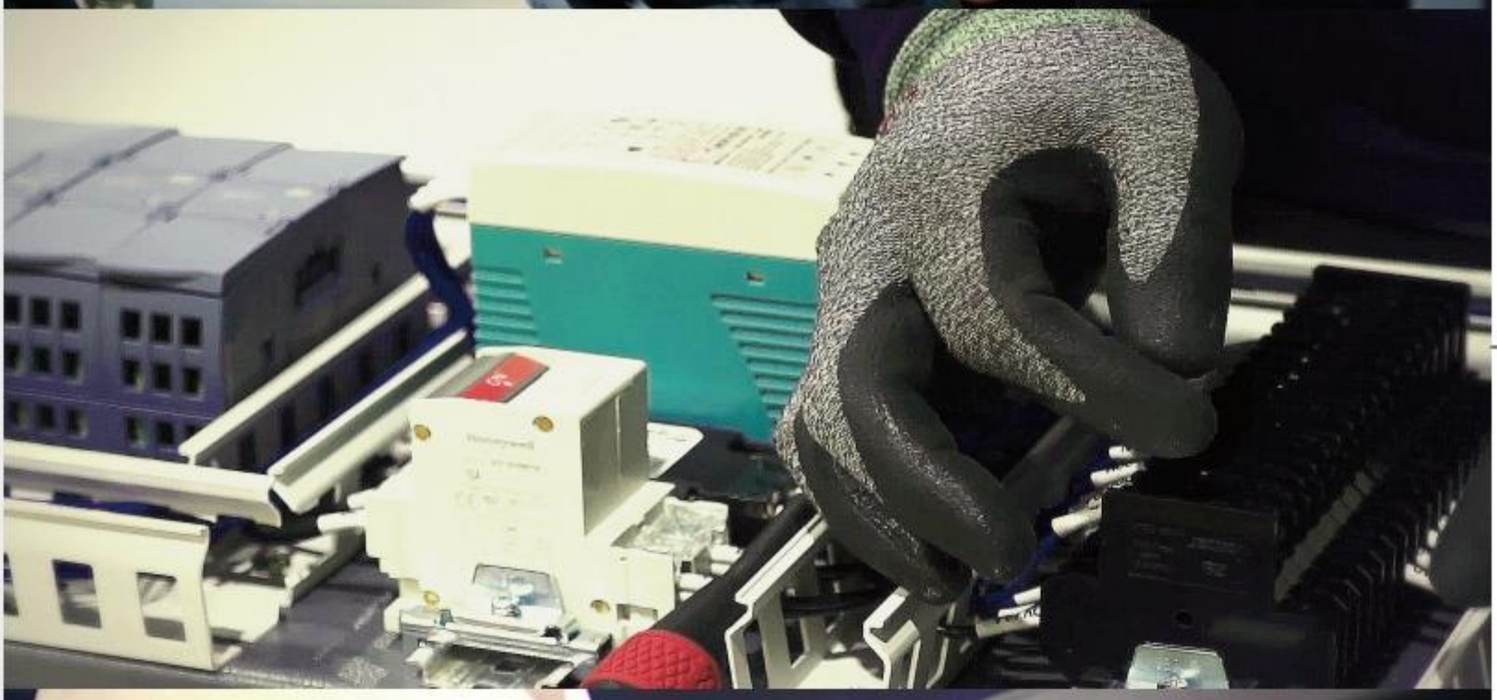


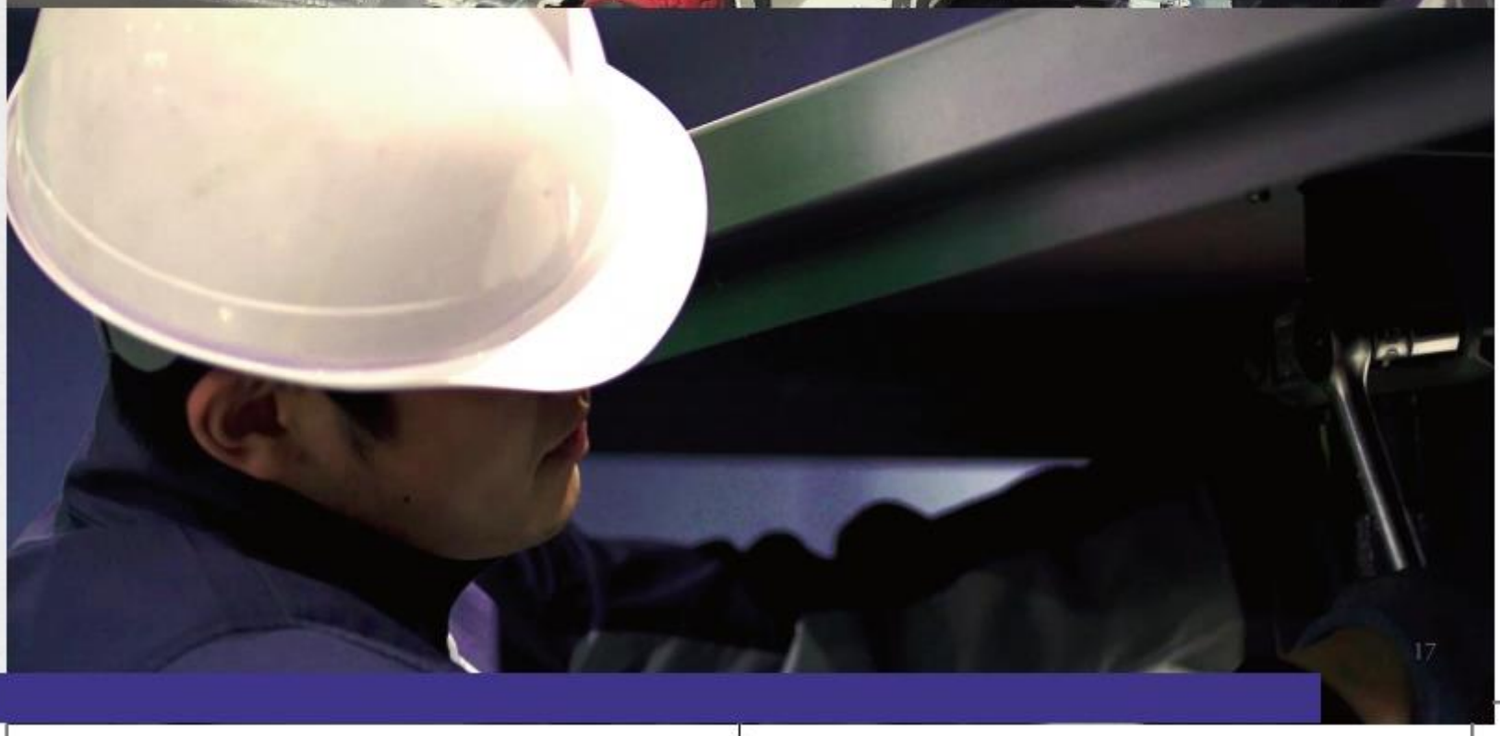
Performance Specification Table

Model Name	Flow	Pressure	Shaft Power	Discharge	Size (mm)			Cooling
	m³/min	(bar)	(HP)	(A KS 10K)	W	L	H	
TB10	3~8	0.3 ~ 0.8	10	80	700	1200	1130	Air cooling
TB15	5~13	0.3 ~ 0.8	15					
TB20	6~15	0.3 ~ 0.8	20	150				
TB30	7~25	0.3 ~ 0.8	30					
TB50	10~42	0.3 ~ 1.2	50					
TB75	18~62	0.3 ~ 1.2	75	200	850	1400	1425	
TB100	23~105	0.3 ~ 1.2	100					
TB125	25~115	0.3 ~ 1.2	125					
TB150	28~130	0.3 ~ 1.2	150	300	1033	2050	1697	
TB200	36~210	0.3 ~ 1.2	200					
TB250	40~235	0.3 ~ 1.2	250					
TB300	80~260	0.3 ~ 1.2	300	400	1263	2260	2428	
TB400	80~275	0.3 ~ 1.2	400	400	1760	2260	2500	
TB500	90~330	0.6 ~ 1.2	500	500	1760	2260	2500	
TB600	100~420	0.6 ~ 1.2	600	500	2210	3500	2435	
TB800	100~520	0.6 ~ 1.2	800	600	2210	3500	2435	
TC50	8~18	1.2 ~ 4.0	50	100	700	1200	1130	Air cooling / Water cooling*
TC75	9~26	1.2 ~ 4.0	75	125	900	1690	1400	
TC100	10~34	1.2 ~ 4.0	100	150	900	1690	1400	
TC150	12~51	1.2 ~ 4.0	150	150	1033	2050	1680	
TC200	12~76	1.2 ~ 4.0	200	200	1033	2050	1680	
TC300	20~98	1.2 ~ 4.0	300	250	1263	2260	2428	
TC400	20~129	1.2 ~ 4.0	400	250	1760	2260	2500	

- Inlet temperature 20°C, Relative Humidity 65%, Density 1.2kg/m³, Inlet pressure 1atm
- Margin of error ±5%
- Above specification can change without notice
- 4.0 bar pressure will use water cooling

Manufacturing and Assembly Process





Namwon Turbo One 's Global Network

Client examples

Seoul, South Korea

Spain

United Kingdom

Indonesia

Malaysia

Chile

Ninghai, Shenzhen, China

NAMWON TURBOONE

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Naju-Si
(Headquarter and Main Factory)

Gwangju Metropolitan City
(Branch Office)

Munpyeong Factory

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