



Technology Innovation Brand Excellence

—— Rolling stock ventilation fan



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Ningbo Longwell Electric Technology CO, LTD

Benchmarking Foreign Fans

LONGWELL Model	Benchmarking Foreign Fan Models	Benchmarking Foreign Fan Manufacturers	Application Environment
LWBE(RT)320-PT-01	K3G280-AK54-21	EBM	Traction and auxiliary converters
LWBE(RT)320-PT-02	/	EBM	Traction and auxiliary converters
LWBE(RT)320-PW-03	GKHR315-CIW.080.5FA	Rosenberg	Air conditioning exhaust unit
LWBE(RT)320-PT-04	GR31C-ZID.DC.1R(182208)	ZIEHL-ABEGG	Traction and auxiliary converters
LWBE(RT)320-PT-05	K3G280BD14N2	EBM	Traction and auxiliary converters
LWBE(RT)280-NW-01	RH25C-61K. BA. CR	ZIEHL-ABEGG	Air conditioning exhaust unit
LWBA(RT)400-NW-01	3EST112-648	Airscrew	Traction and auxiliary converters
LWBA(RT)355-PW-01	2CS7352-1RG81-OCK1	SIEMENS	Traction and auxiliary converters
LWBA(RT)320-NW-06	/	ZIEHL-ABEGG	Inverter cooling unit
JLWBA(RT)355-PW-02	2CS7352-1RG11-3BH3	SIEMENS	Traction and auxiliary converters
LWBA(RT)320-NW-08	DKH_W315-F_098. 6FA	Rosenberg	Air conditioning exhaust unit
LWBE(RT)280-NW-02	RLA 51-2528-2D-S-177422	NICOTRA/Gebhardt	Locomotive filter cubicle

INNOVATION

BOUTIQUE

SAFETY

SERVICE

SHARING

R&D CAPABILITIES

SAFE AND RELIABLE, PRACTICAL AND INNOVATIVE

HARDWARE DESIGN

- Analog Circuit
- Digital Circuit
- System Circuit

SOFTWARE DESIGN

- Modular Design
- EN50128 / SIL2
- Object-oriented Development Language

STRUCTURE DESIGN

- EN15085
- Strength Calculation
- Thermal Design Analysis
- Three-dimensional Simulation

PROCESS DESIGN

- EMC Design
- Protection Class Design
- Vibration Resistance
- Wiring Process

The practical innovation is preferred, on the condition that the safety and reliability of the product are ensured. Tongye advocates to learn the mature and advanced technology and process from other technological areas, and apply them in the rail transit industry. Nevertheless, the innovation must be advanced, positive and valuable.

The R & D personnel of product development center account for about one third of the total number of Tongye. We have carried out extensive technical cooperation and exchanges with the internationally renowned enterprises, such as Siemens, Knorr, and so on. In addition, some R & D personnel are sent abroad to have training and courses for many times, so that their international vision are cultivated.



INVENTION PATENTS



UTILITY MODEL PATENTS



SOFTWARE COPYRIGHTS



Production Controlling

SOPHISTICATED TECHNOLOGY, SAFE PRODUCTION

Driven by the "craftsmen spirit", we maintain the "rigorous, focused, persistentmeticulous"attitude, and pay attention to the cultivation of versatile talents.

We also ensure the product consistency in production process through thesophisticated technology, continuous on-site improvement, optimized process,and flexible production.



Process Control

Six main production processes: wiring assembly, components assembly, modules assembly, final assembly, commissioning aging and finished product inspection

Five special processes controls: crimping, soldering, riveting,spray painting and bonding

Four key processes : commissioning, aging, voltage-withstanding tests and routine tests

Products And Application



LOCOMOTIVE PRODUCTS



URBAN RAIL PRODUCTS

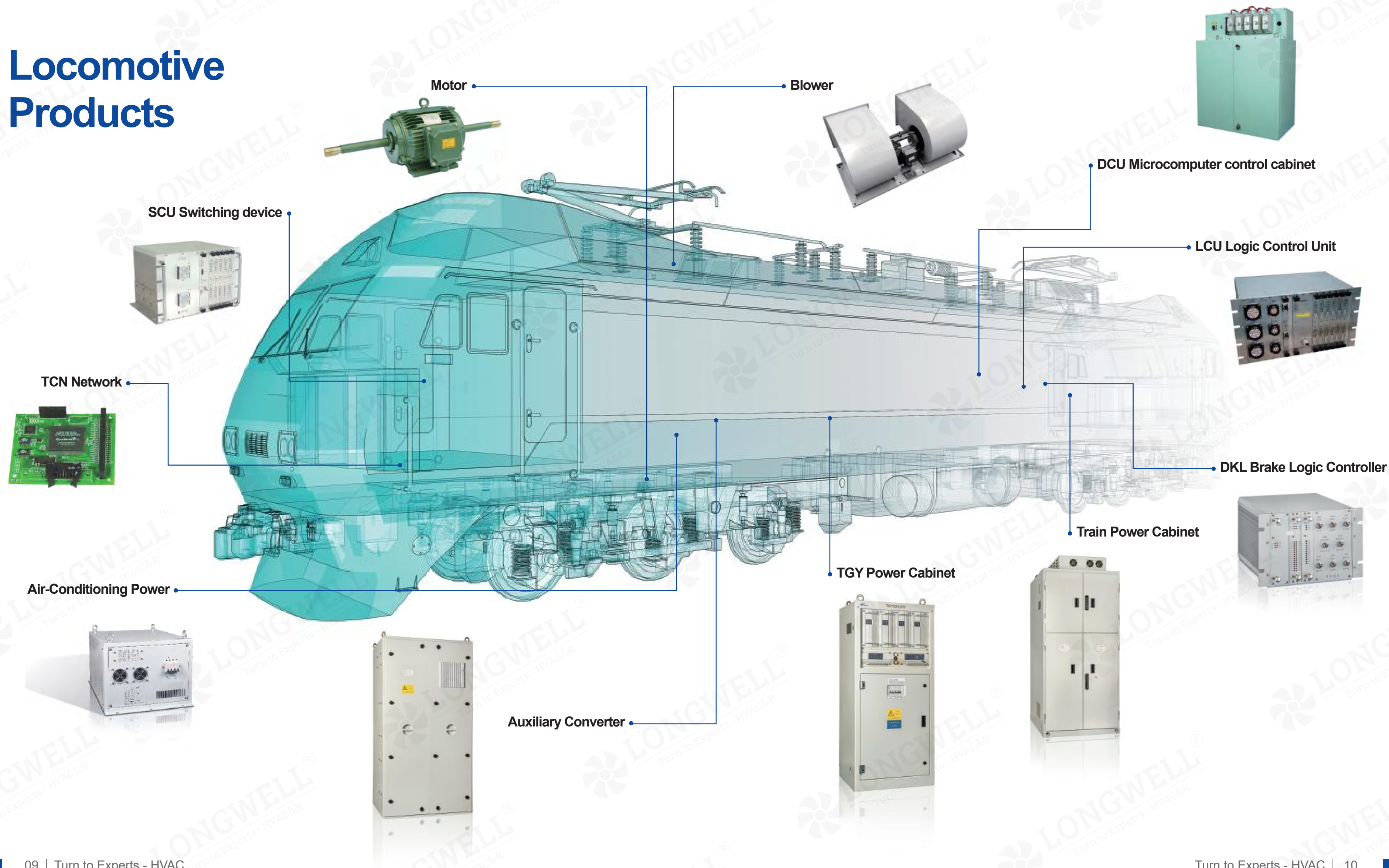


HIGH-SPEED RAIL PRODUCTS

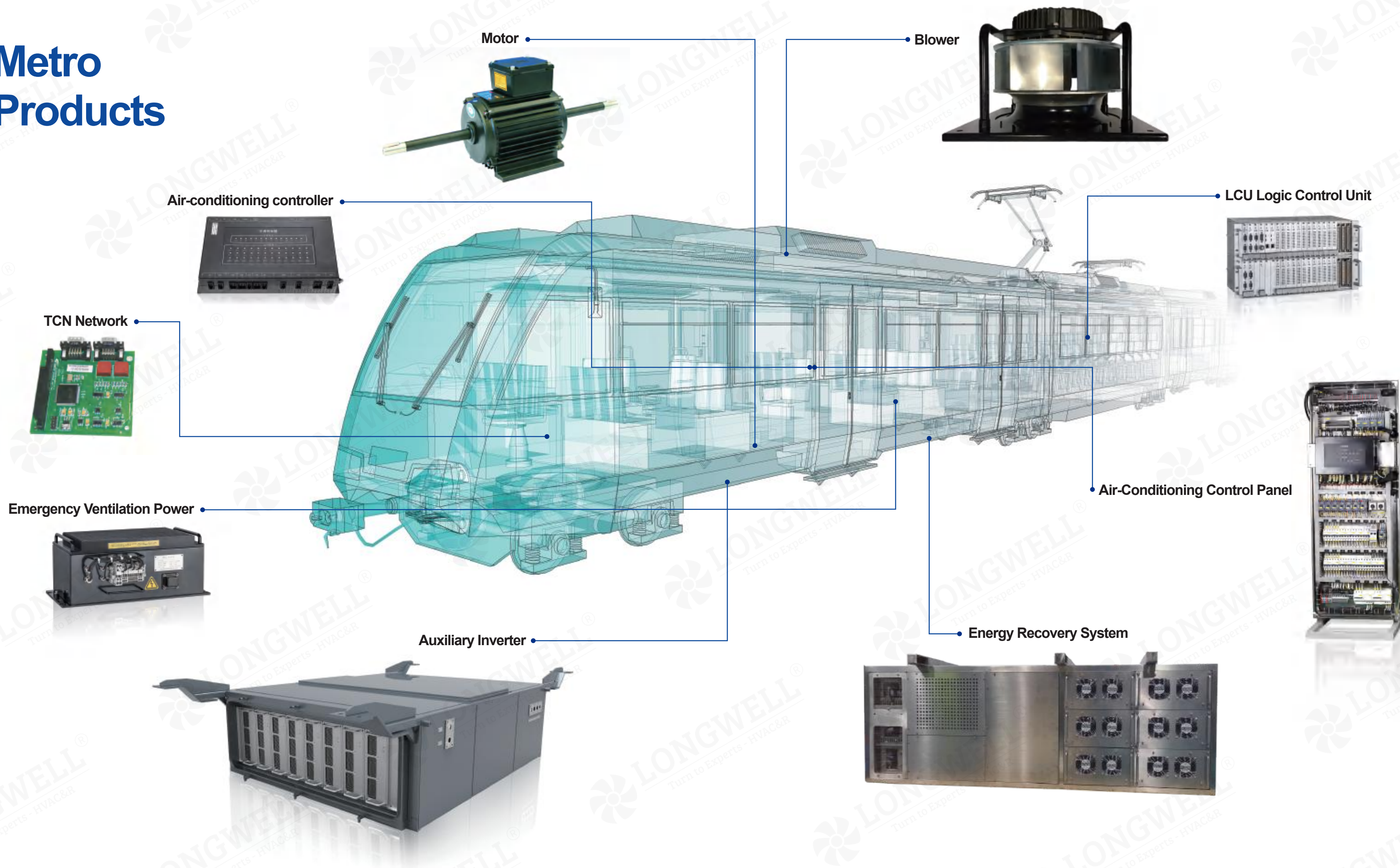


NEW ENERGY PRODUCTS

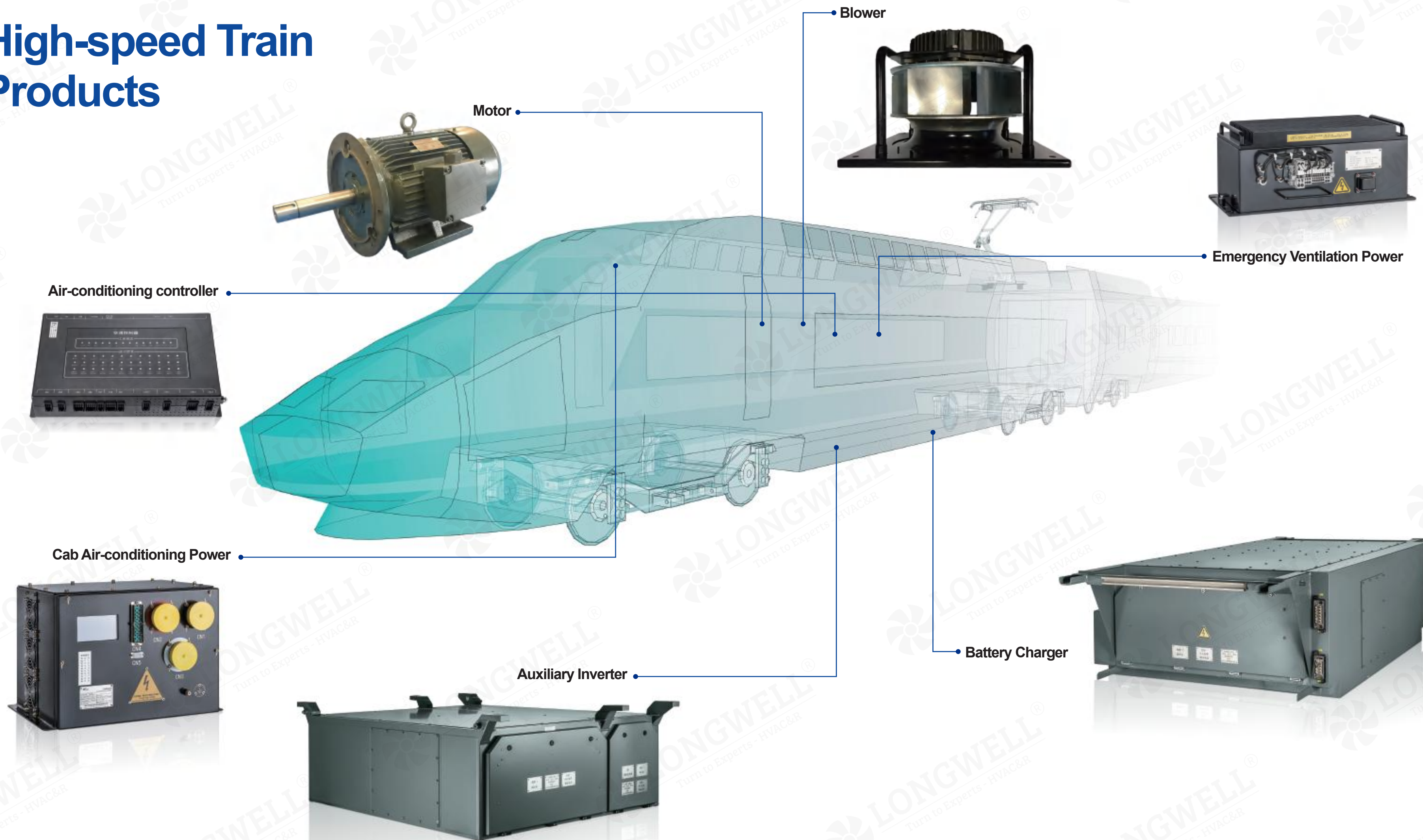
Locomotive Products



Metro Products



High-speed Train Products



New Energy Products

Super Capacitor Charger



Application Areas



Tram



Trolleybus



Electric Bus



Application Areas



Oil Field



Port



Urban Railway



Metro

Type of fan product



Axial fan

Mainly used in air conditioning system



EC fan & blowers

EC motor is used as the driving source
suitable for different fan types



Forward multi-wing centrifugal fan

Mainly used in air conditioning system
high static air pressure

Backward centrifugal fan

Mainly used in auxiliary system and
air conditioning system

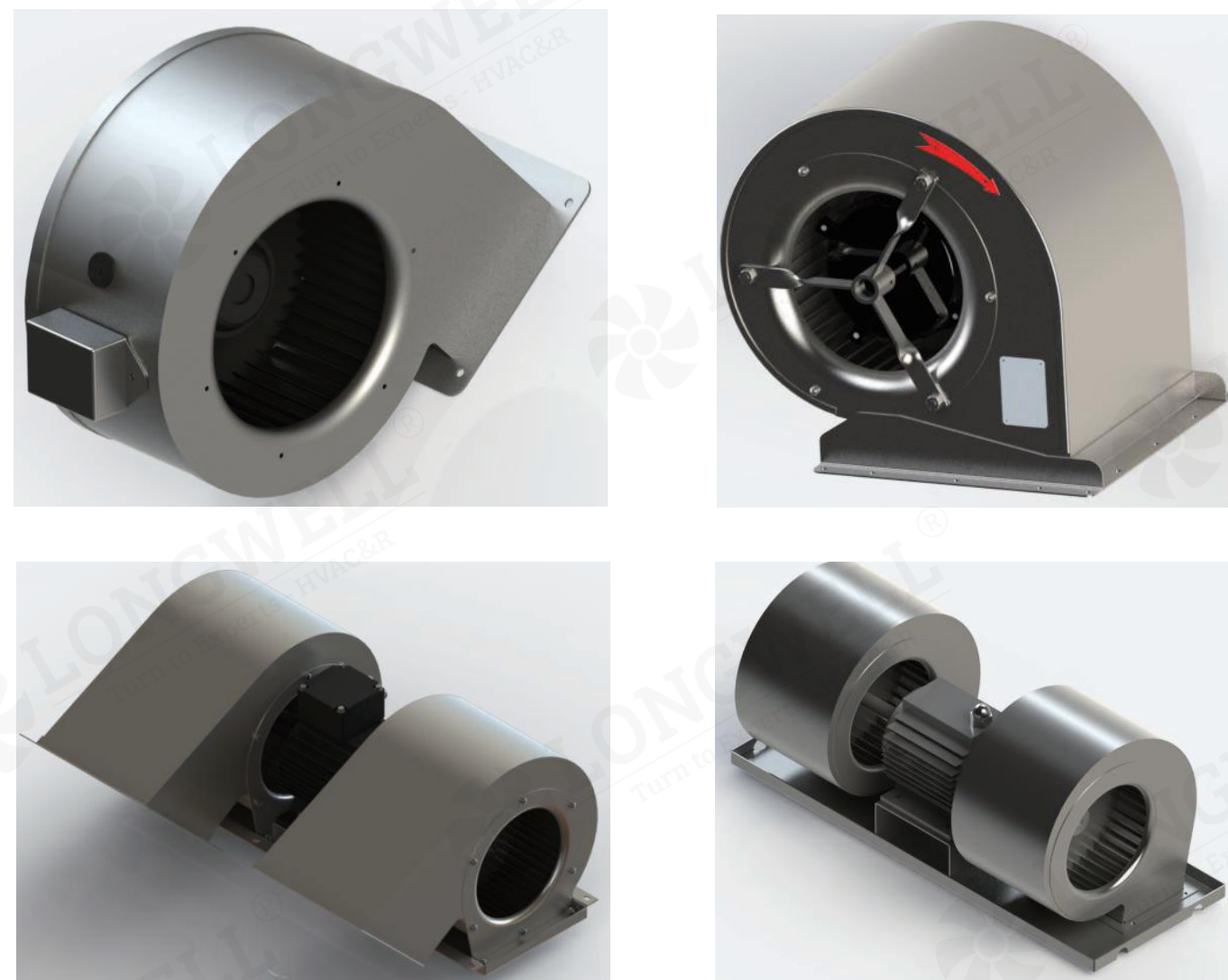


Mixed flow fans

mainly used in auxiliary system



Three-phase asynchronous centrifugal fan



Single-pole,bipolar and compact external rotor centrifugal fans

Power	0.12-1.8KW
Air Flow	150-8000m³/h
Static air pressure	130-800Pa
Noise level	61-68dBA
Service life	30000-50000h
Matching motors type	Internal rotor and external rotor motor
Application	Air conditioning system,Auxiliary heat dissipation

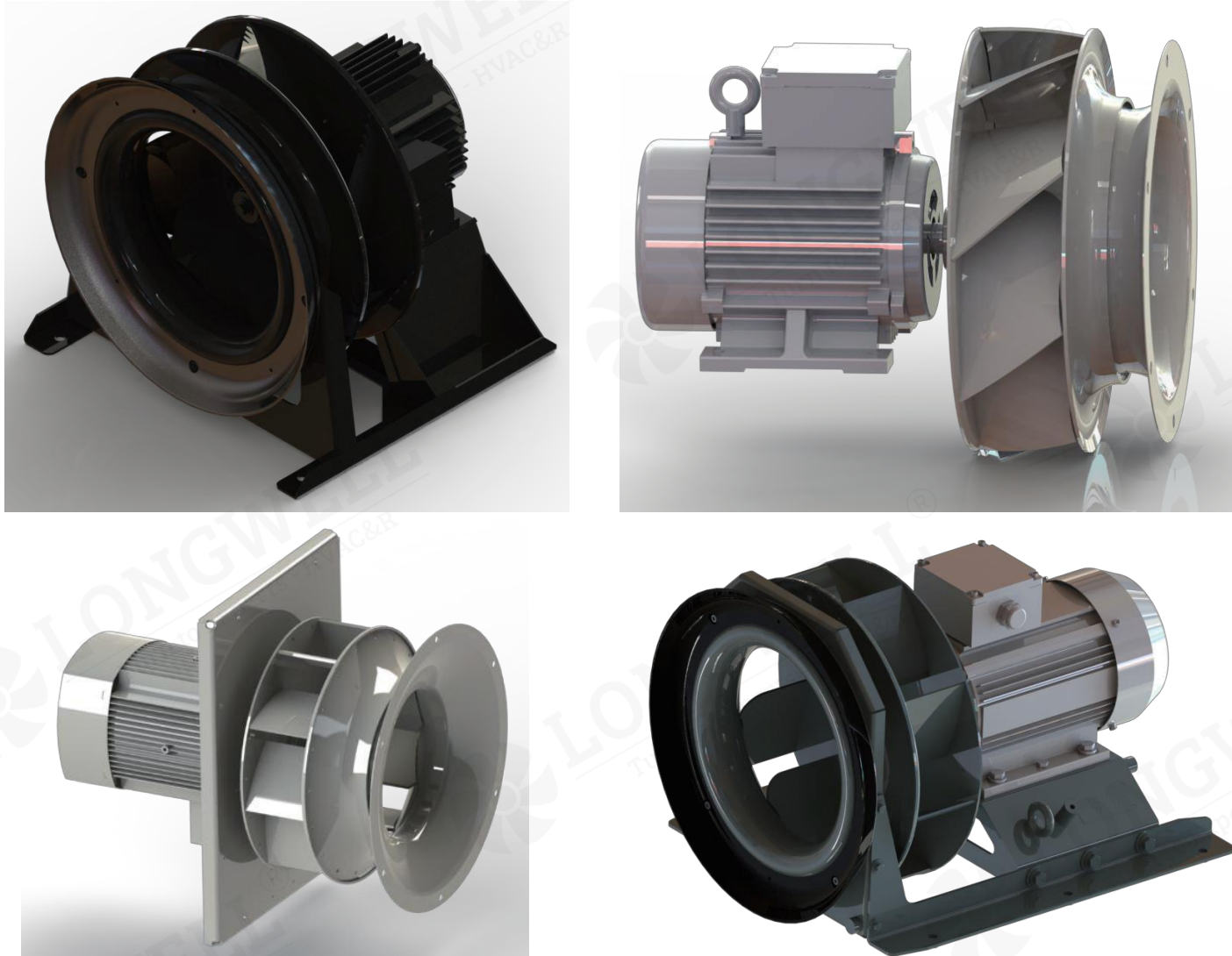
Three-phase asynchronous axial fan



Welding,riveting,die casting and other platform design of the leaf shape

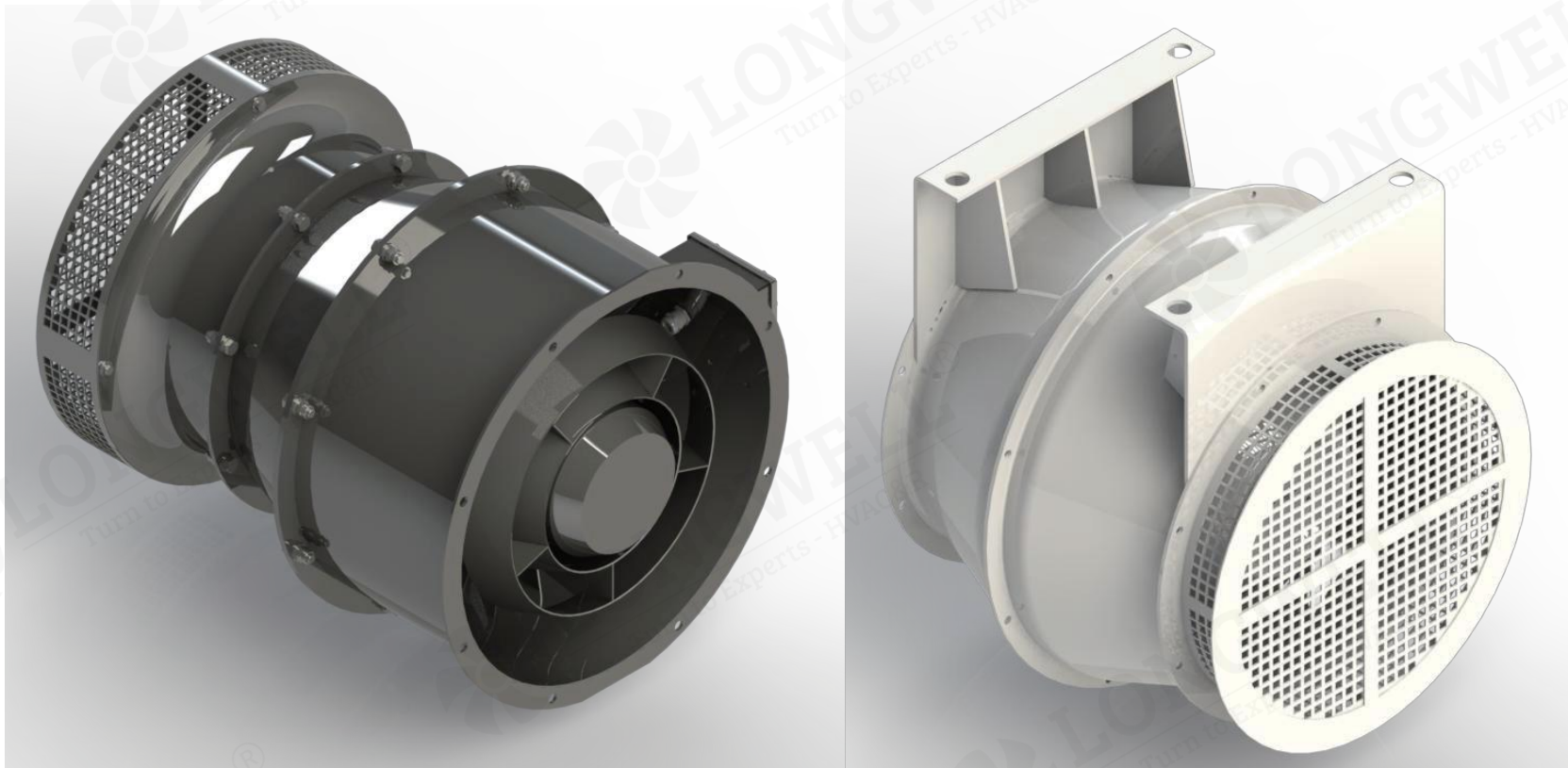
Power	0.55-3KW
Air Flow	5000-14000m³/h
Static air pressure	60-500Pa
Noise level	68-84dBA
Service life	30000-50000h
Application	Air conditioning system,Auxiliary heat dissipation

Specification of backward curved centrifugal fan



Welding,riveting,die casting and other platform design of the leaf shape	
Power	0.2-8KW
Air Flow	1000-15000m³/h
Static air pressure	200-2000Pa
Noise level	68-95dBA
Service life	30000-50000h

Specification of mixed flow fans



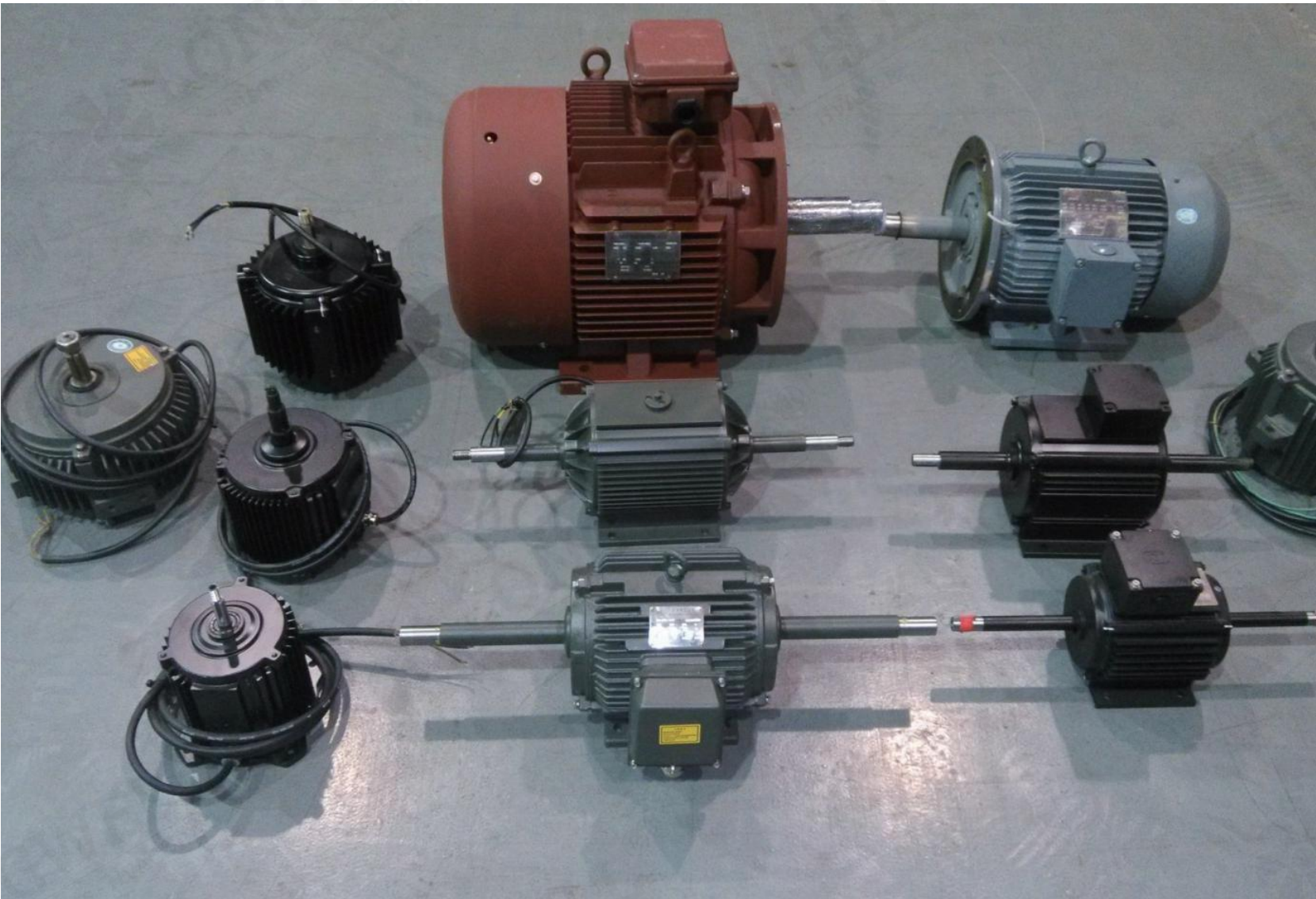
Specification of mixed flow fans	
Power	0.75-3KW
Air Flow	2400-10000m³/h
Static air pressure	200-320Pa
Noise level	70-90dBA
Service life	30000-50000h
Matching motors type	Internal rotor motor

EC motor fans



Specification of EC motor fans	
Power	0.55-2KW
Air Flow	0-14000m³/h
Static air pressure	0-1500Pa
Noise level	55-84dBA
Impeller type	forward curve sirocco type,backward curved type,axial flow type
Control system	0-10V or customization
Voltage type	AC380-400V,DC110/24/48,etc
Application	Air conditioning system,Auxiliary heat dissipation

Customization for motors



Customization for Motors			
Types	Three-phase or single phase asynchronous motor		
Housing size	63-200	Motor Power	0.12-35KW
Voltage	<=690V	Frequency	5-100Hz
Insulation Class	F/H	Protection class	IP54/IP55/IP56
Vibration standard	ISO10816	Motor speed	Single or multi speed
Energy Efficiency Grade	IE2 High efficiency/IE3 Super high efficiency		
Installation	B3/B30/B35/B5/V31/V1/V2		

Application of fan & blowers

Light weight ,small size ,low noise level,High reliability, long life,adapt to vibration, high and low temperature hot and humid alternating special environment



- Train Units Air conditioning system
- Train Units heat--dissipation system
- Auxiliary inverter Cooling system
- Traction Units air compressor cooling system
- Other special custom motors

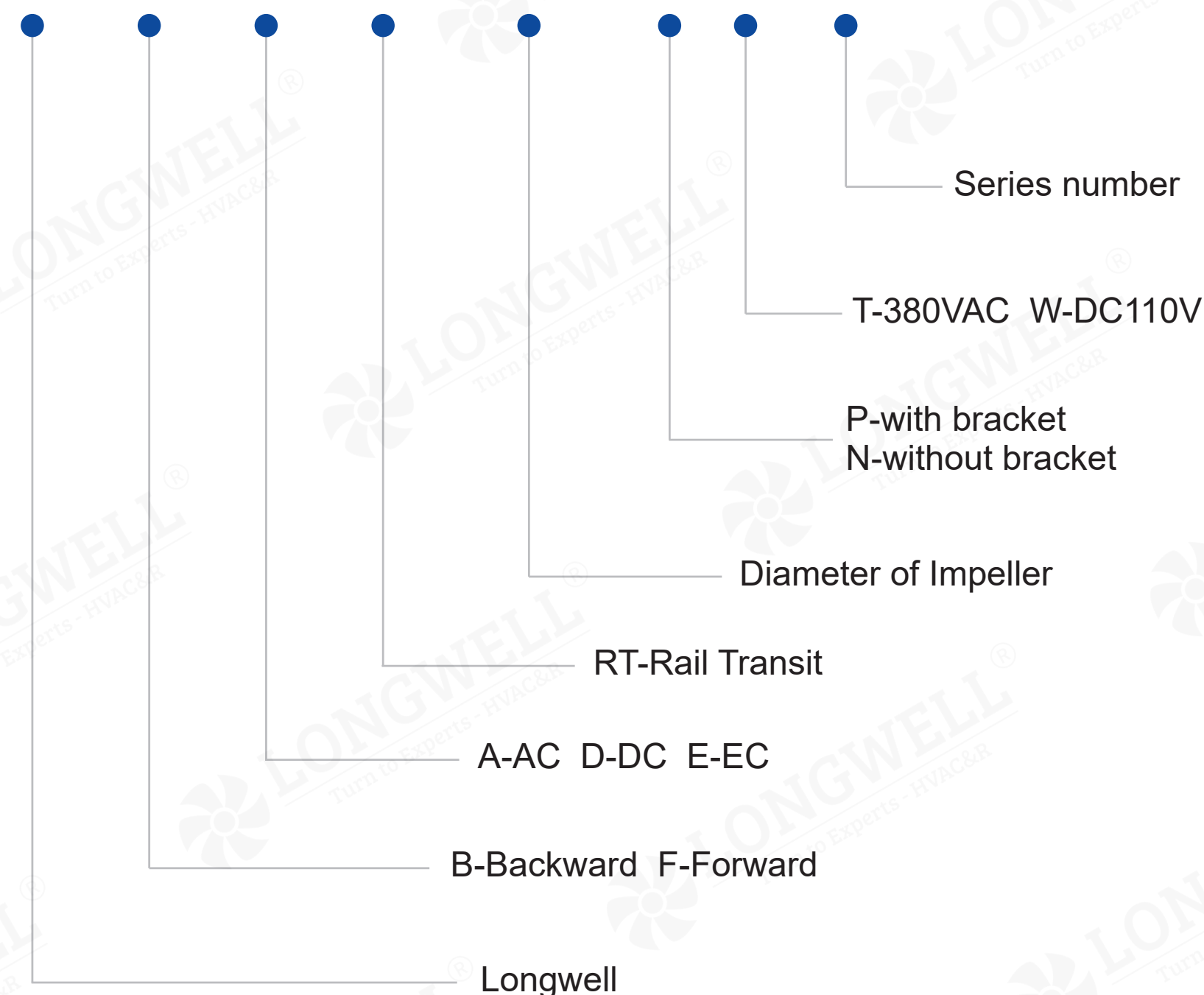
Rolling Stock Ventilation Fan

Technology Innovation, Brand Excellence



Type Code

LW B E (RT) 300 - P S - 01



PMSM01 Type EC Backward centrifugal fan

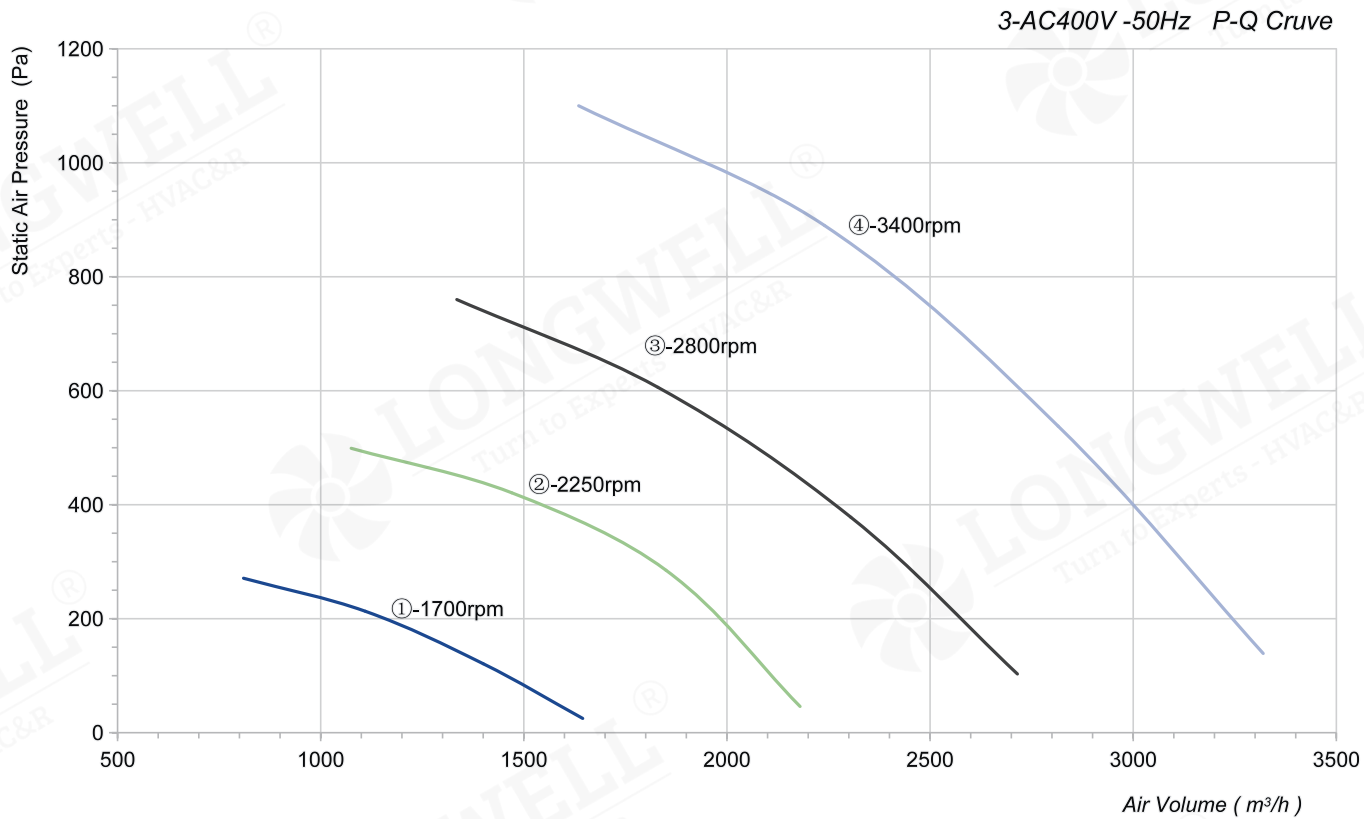
Product Characteristic

- Train Types: Urban rail transit
- Product Code: PMSM01
- Material: Q345E/5754
- Protection Class: IP54
- Insulation Class: B
- Weight: 14kg (±0.5)
- Application Units: Subway auxiliary inverter

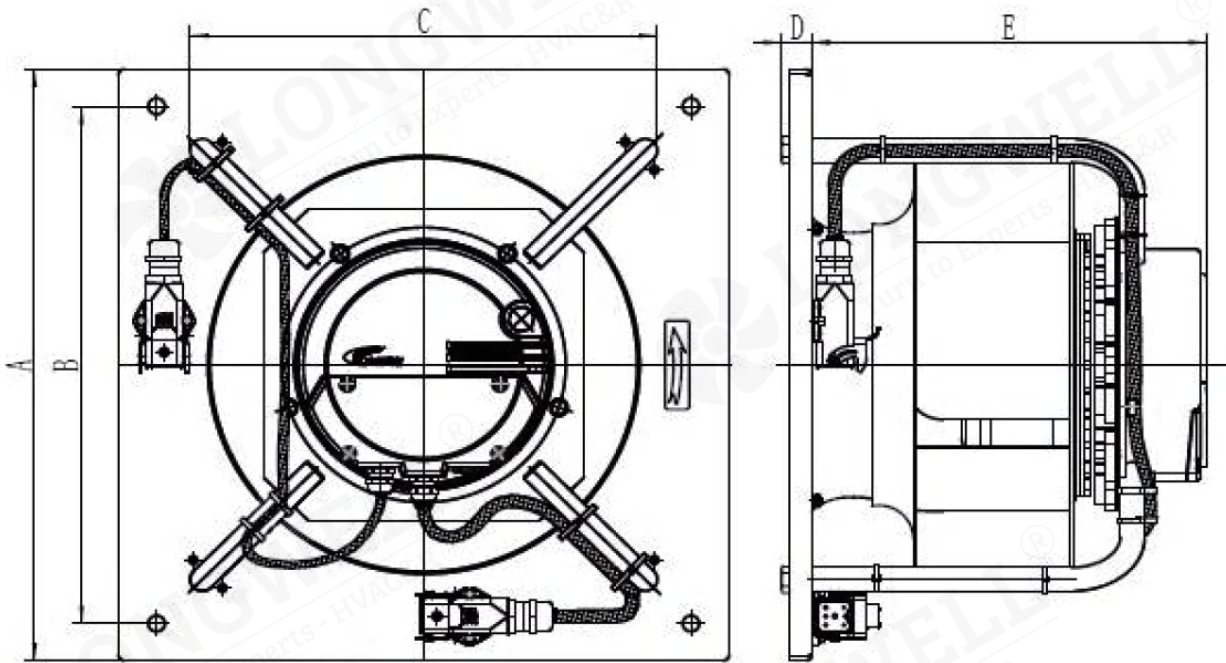


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)320-PT-01	AC380-480V	50/60	1.03	1.8	3320	1100	3400	≤84



Product Drawing (mm)



	Size (mm)	Tolerance (mm)
A	400	±2
B	350	±0.5
C	≤306	±1
D	16	±1
E	261	±2

PMSM04 Type EC Backward centrifugal fan

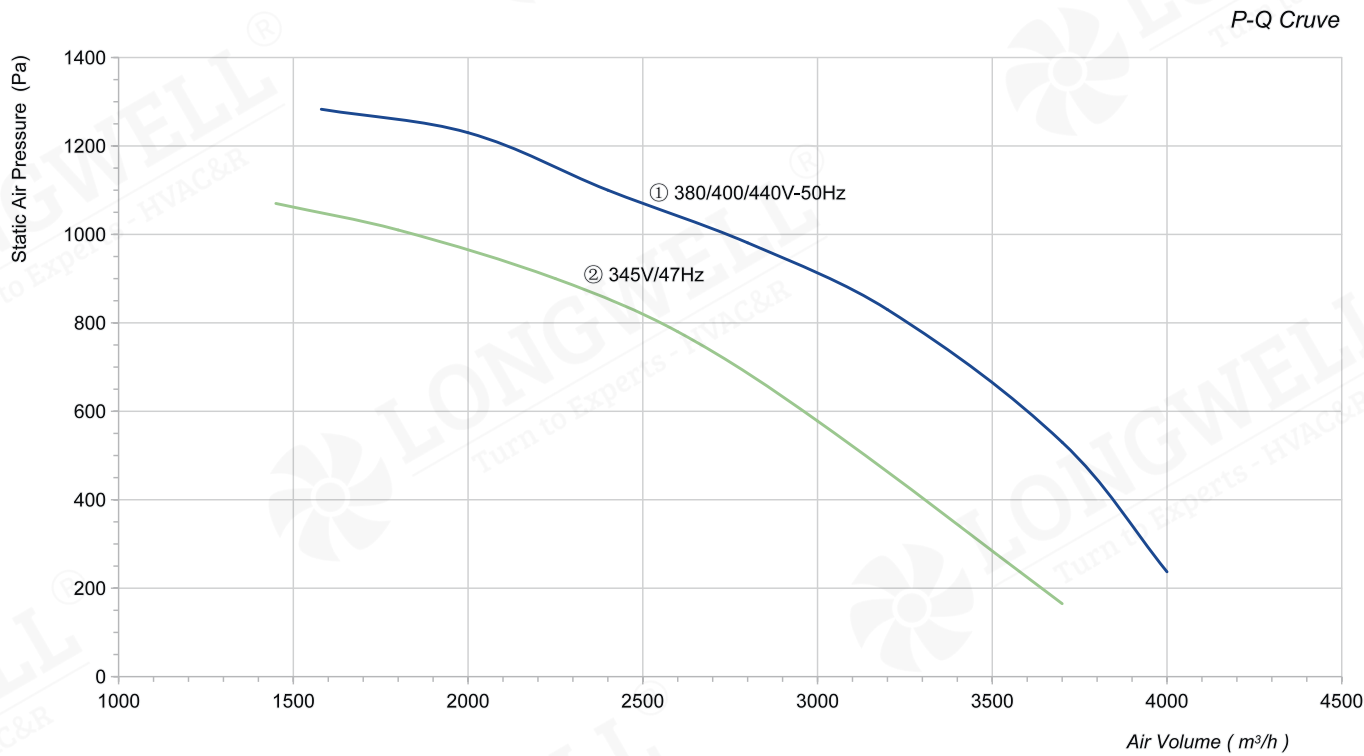
Product Characteristic

- Train Types: Urban rail transit
- Product Code: PMSM04
- Material: Q345E/5754
- Protection Class: IP55/IP44
- Insulation Class: F
- Weight: 18kg (±0.5)
- Application Units: Subway auxiliary inverter Cooling system

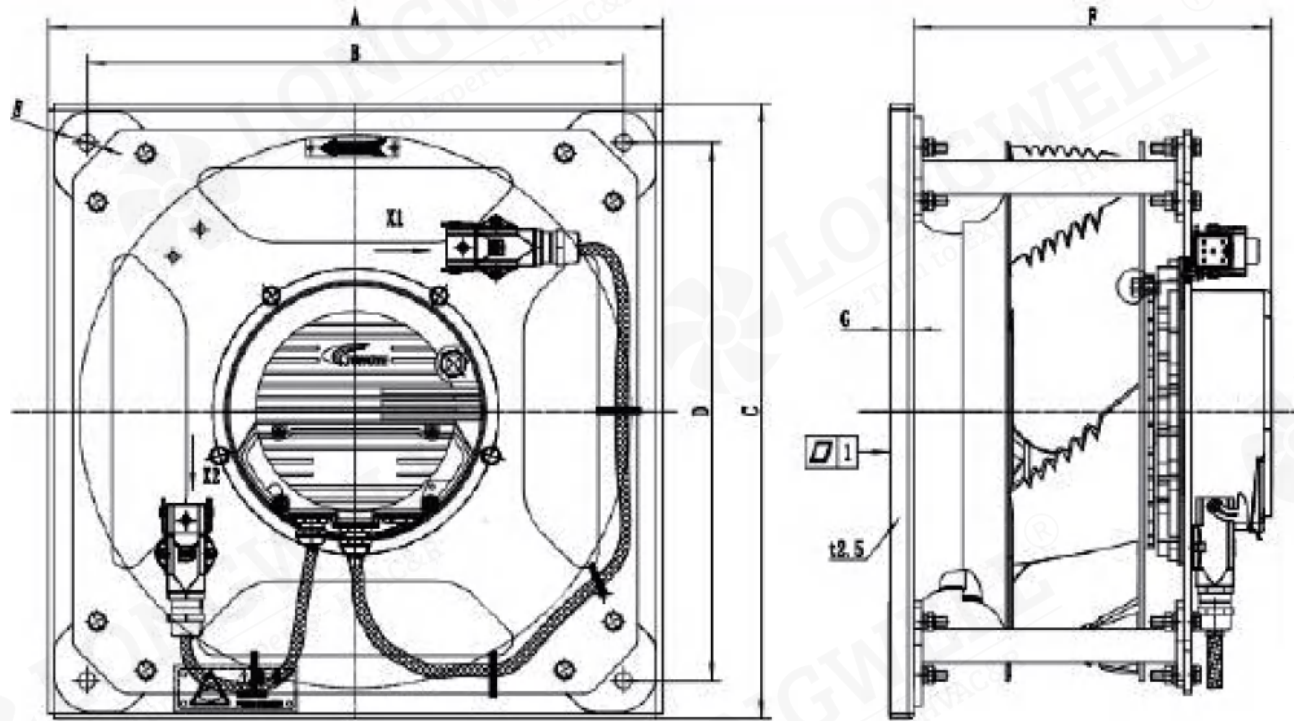


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)320-PT-02	AC380-480V	50/60	1.8	2.7	2400	J1000	2800	< 79



Product Drawing (mm)



	Size (mm)	Tolerance (mm)
A	400	±2
B	350	±1
C	400	±2
D	350	±1
E	φ 11	±0.5
F	232.5	±4
G	15	±1

Standard high speed train intelligent emissions system

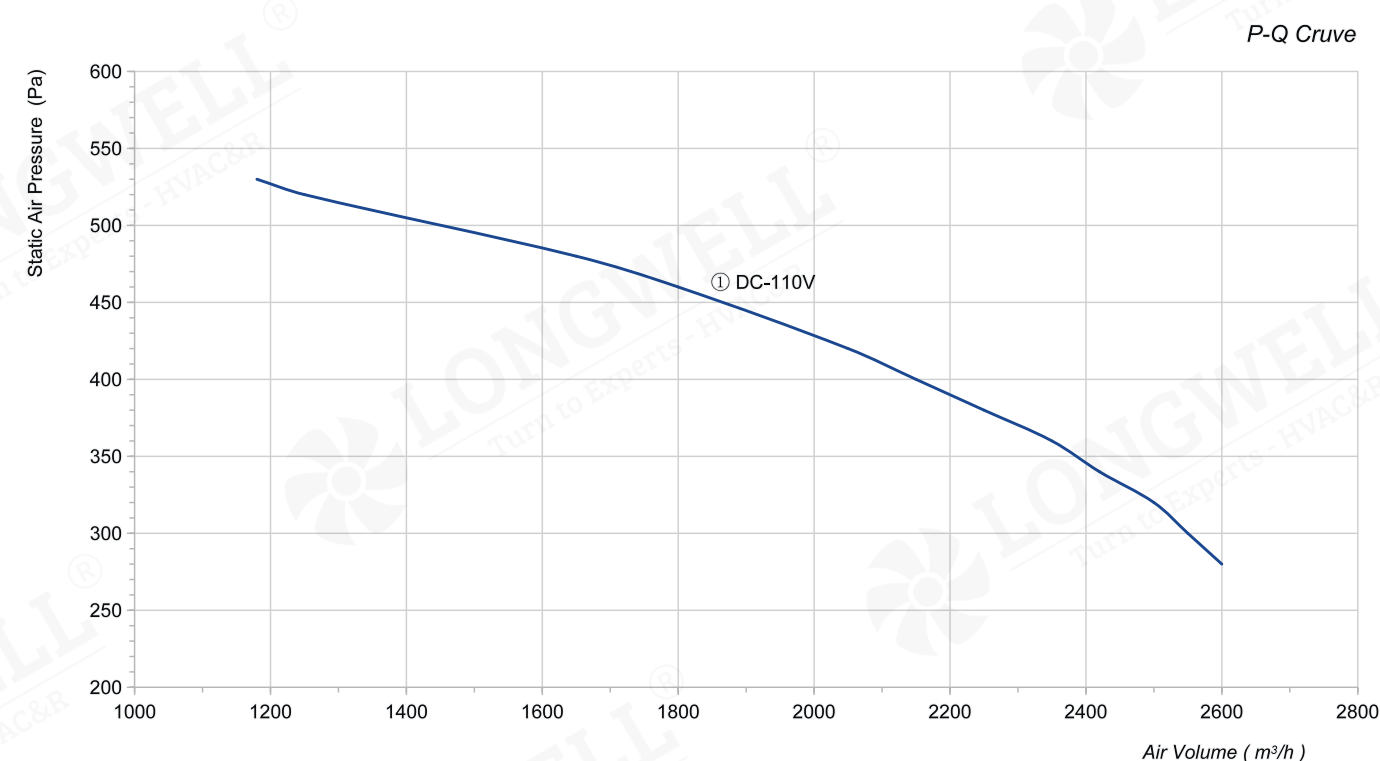
Product Characteristic

- Train Types: Bullet train
- Product Code: PMSM
- Material: 5754
- Protection Class: IP54
- Insulation Class: F
- Weight: 10kg
- Application Units: Standard High speed train intelligent Emissions system

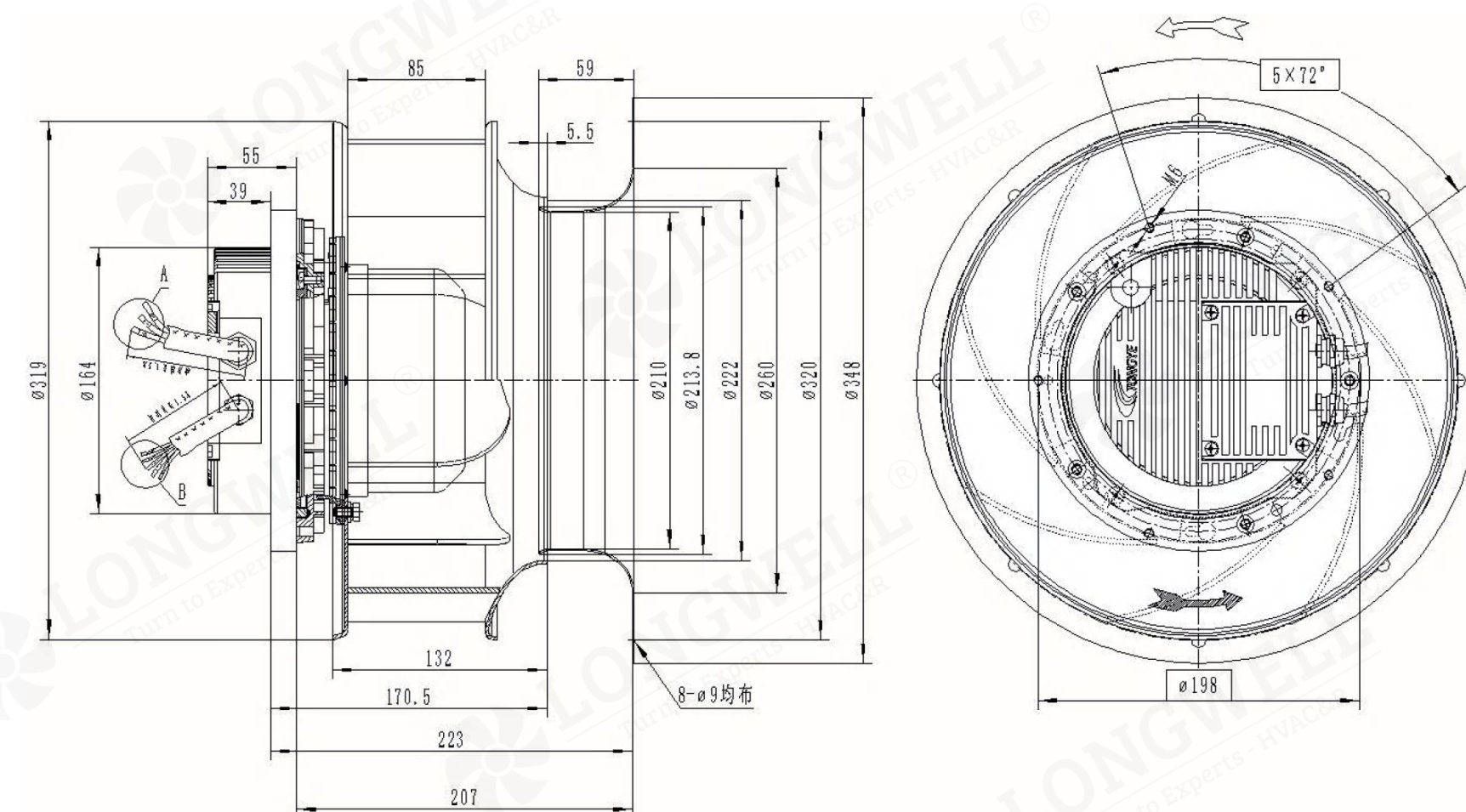


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)320-PW-03	DC110V	/	0.9	8	1800	J490	2300	< 76



Product Drawing (mm)



Traction and auxiliary inverter cooling

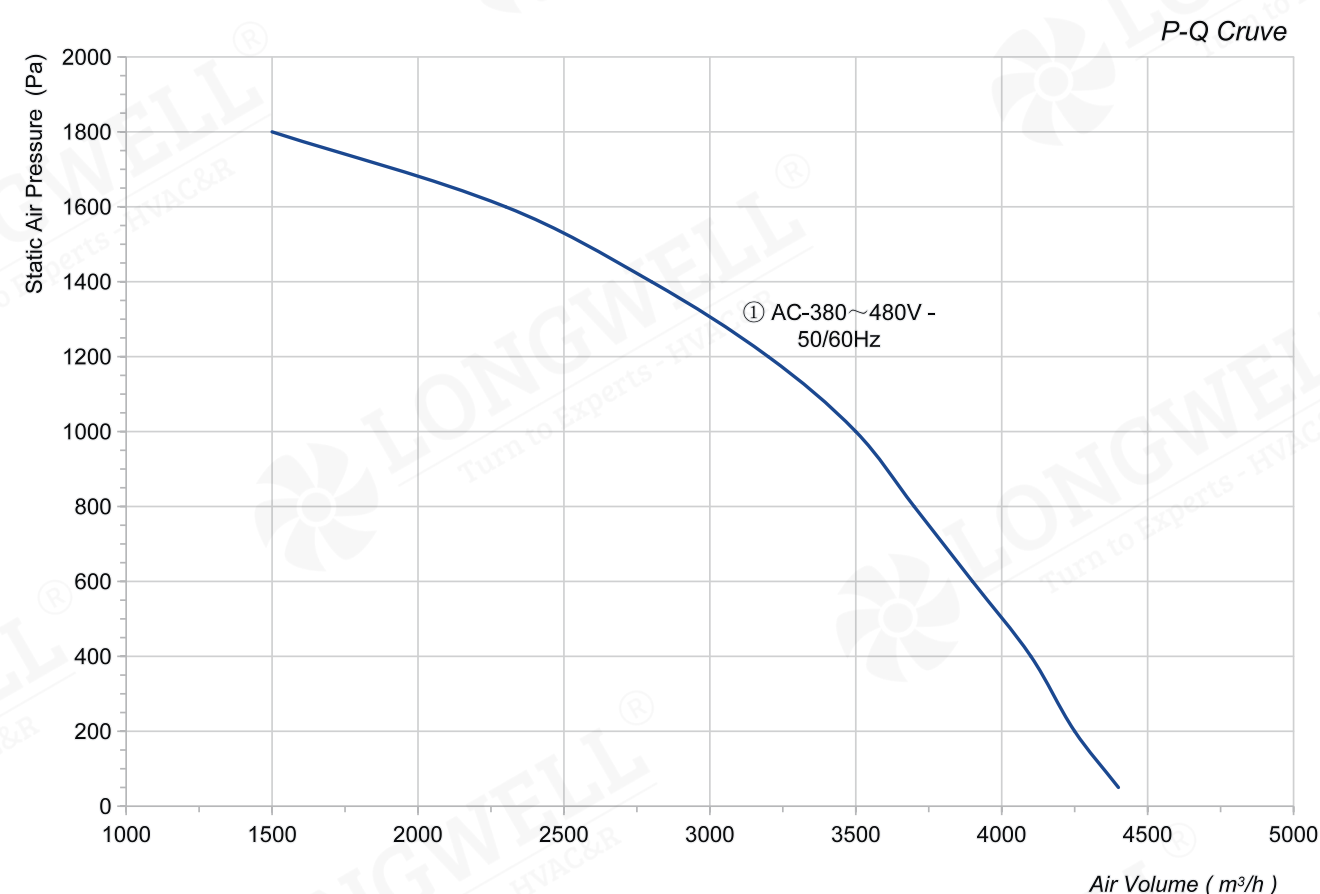
Product Characteristic

- Train Types: Urban rail transit
- Product Code: PMSM02C
- Material: Q345E/5754
- Protection Class: IP56
- Insulation Class: H
- Weight: 22kg
- Application Units: Urban rail traction and auxiliary inverter

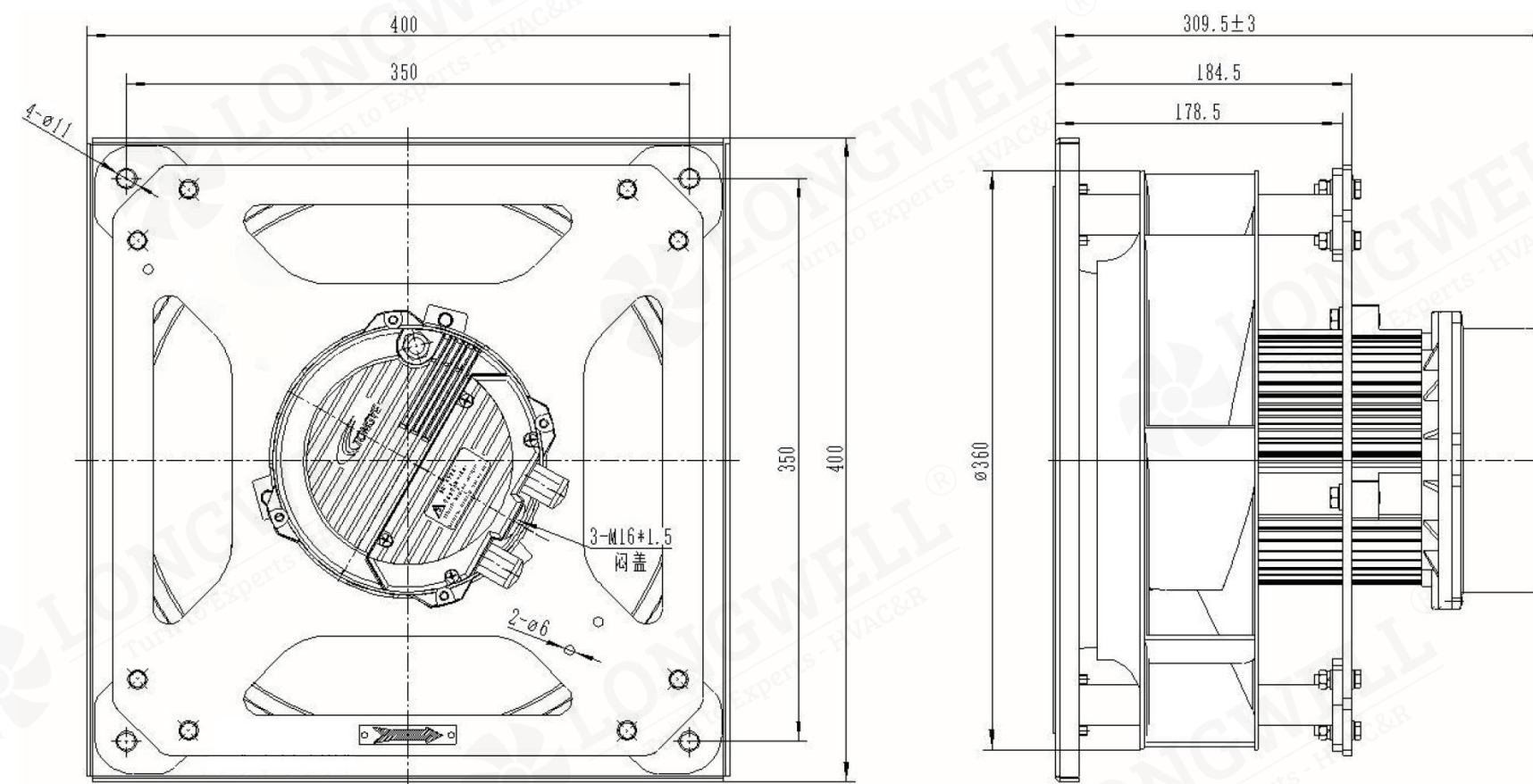


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)320-PT-04	AC380-480V	50/60	2.2	3.8	2520	J1500	3400	< 80



Product Drawing (mm)



Traction and auxiliary inverter cooling

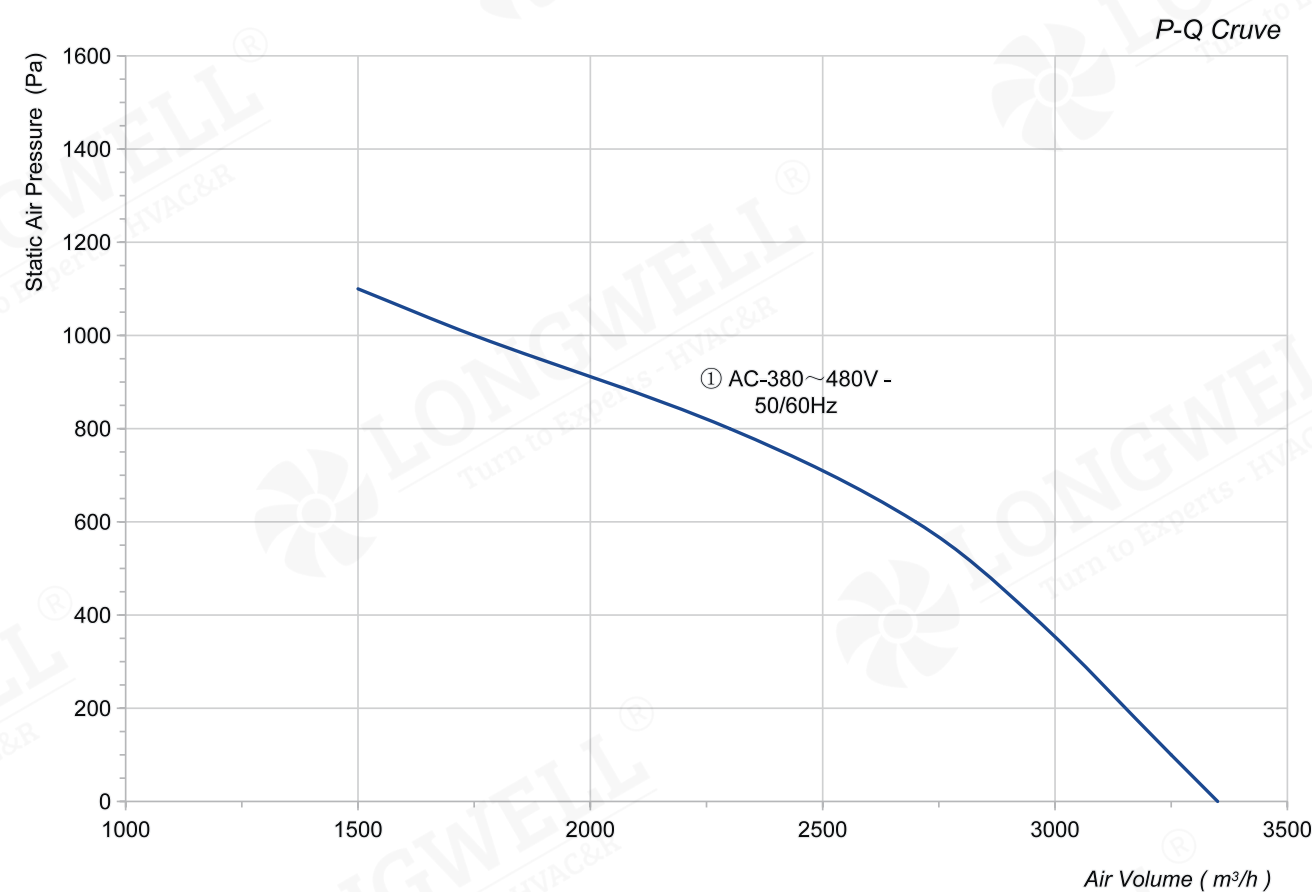
Product Characteristic

- Train Types: Urban rail transit
- Product Code: PMSM04E
- Material: Q345E/5754
- Protection Class: IP56
- Insulation Class: H
- Weight: 20kg
- Application Units: Urban rail auxiliary inverter

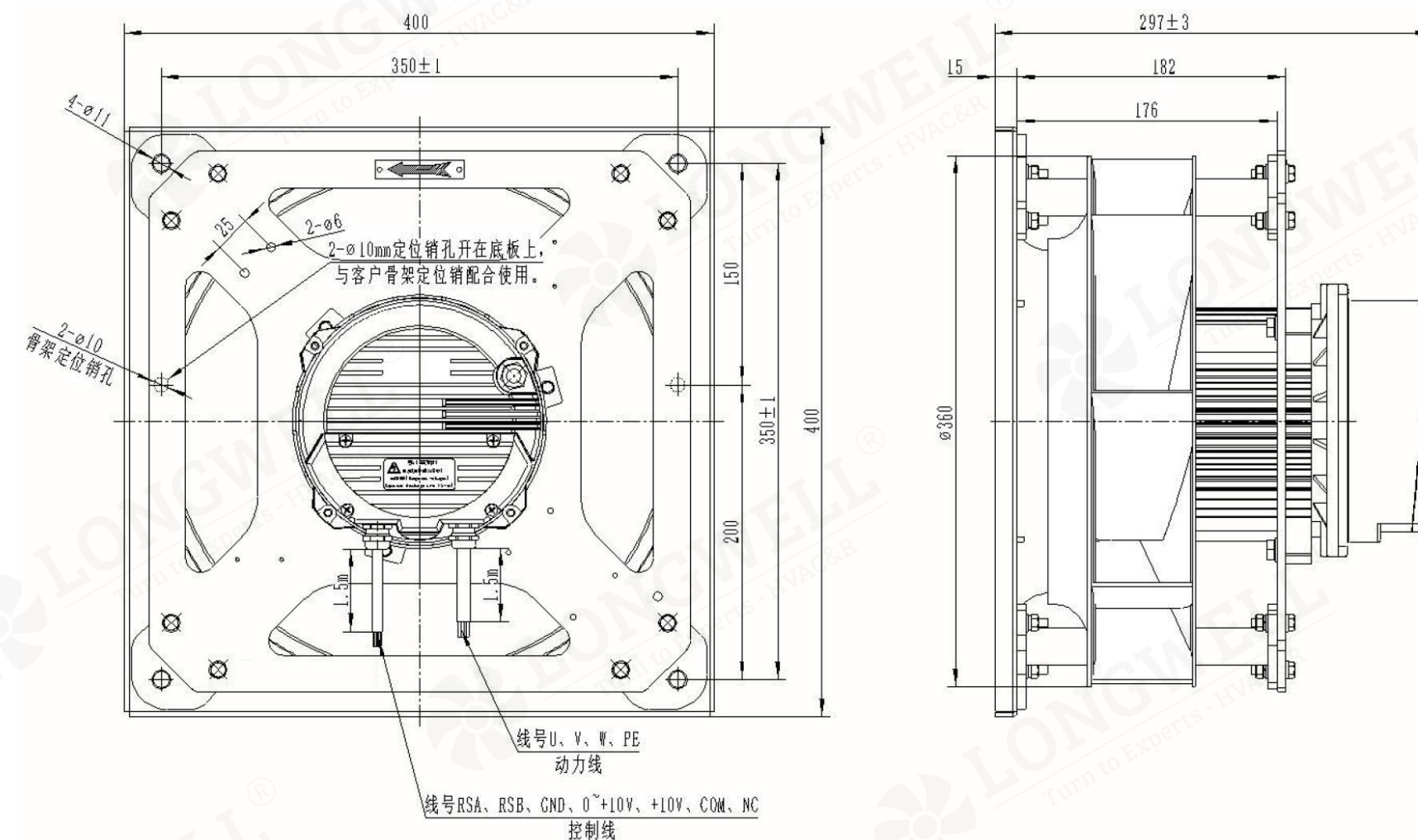


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)320-PT-05	AC380-480V	50/60	0.8	1.8	2235	J760	2600	< 80



Product Drawing (mm)



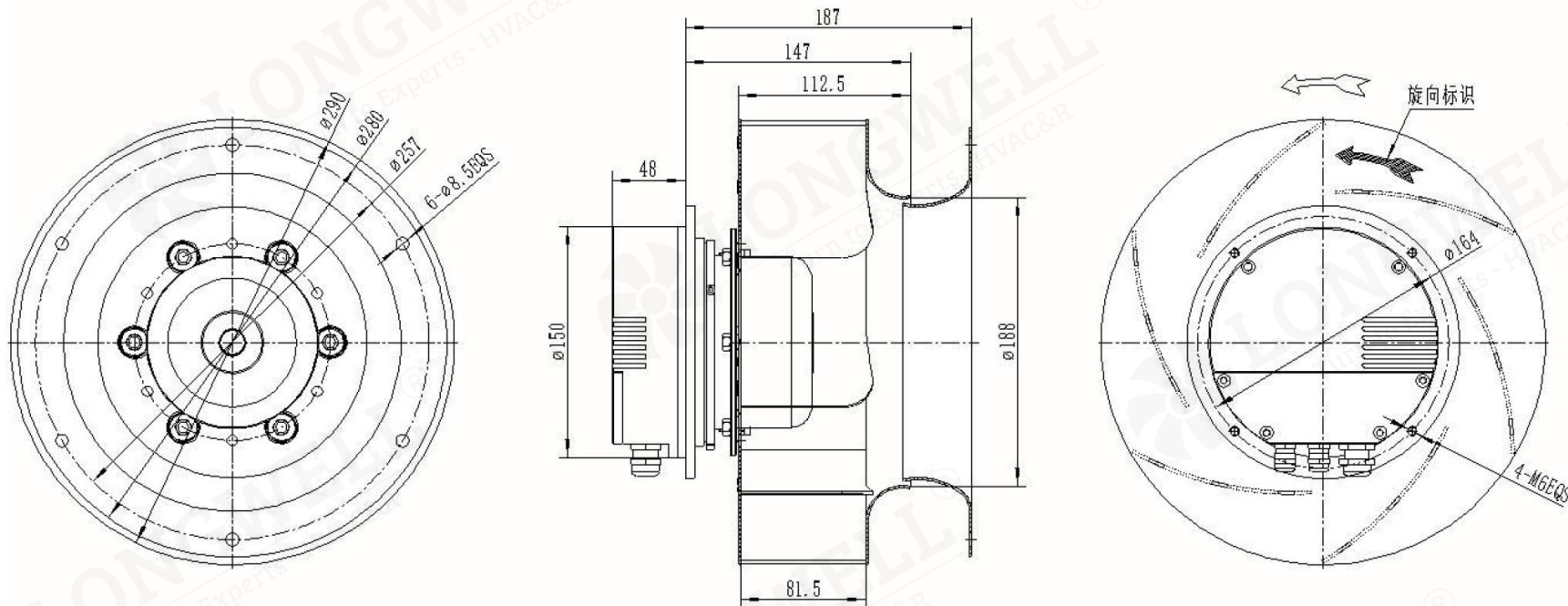
City High-speed train intelligent Emissions system

Product Characteristic

- Train Types: Bullet train
- Product Code: PMSM11B
- Material: 5754
- Protection Class: IP54
- Insulation Class: F
- Weight: 7kg
- Application Units: City High-speed train
intelligent Emissions system

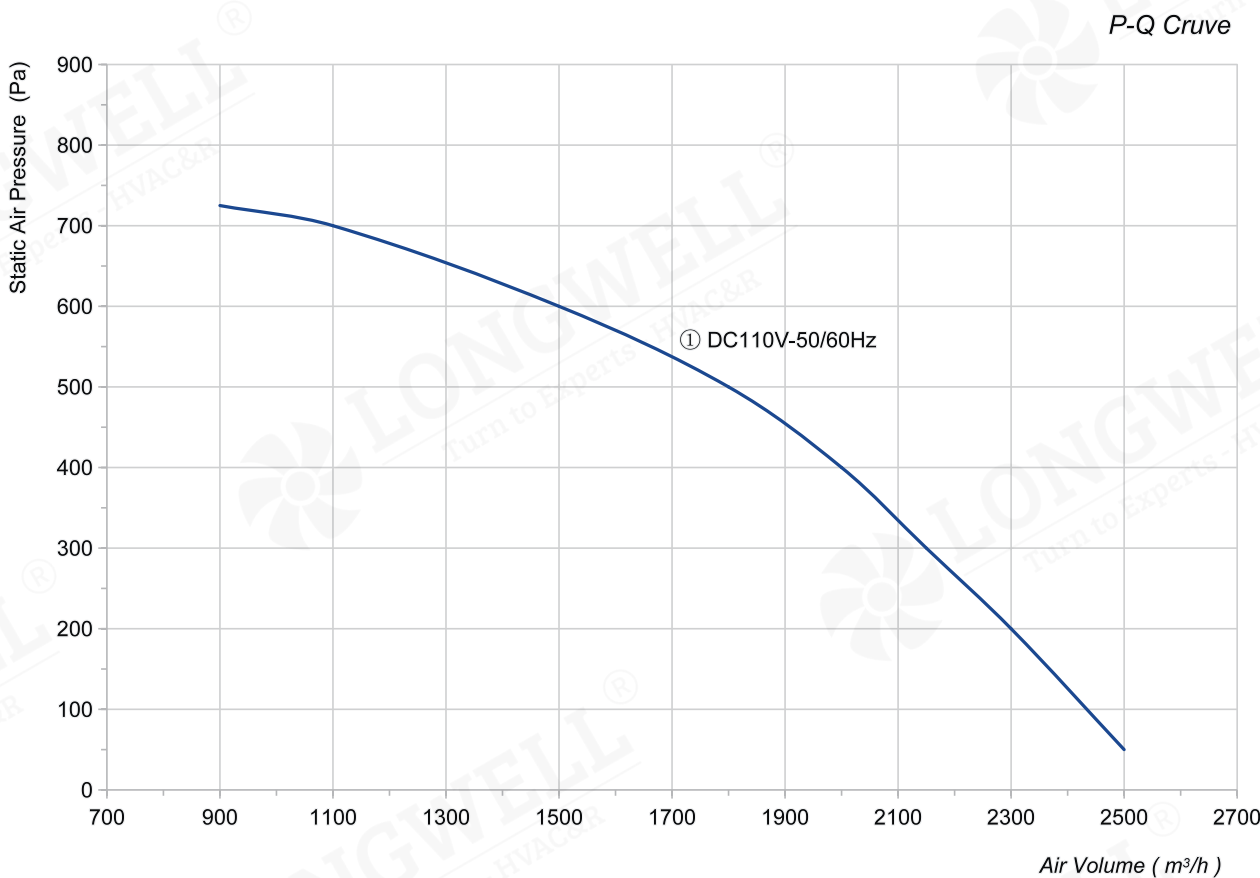


Product Drawing (mm)



Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (KW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)280-NW-01	DC110V	50/60	0.5	4.5	1600	J500	2600	< 66



Backward curved centrifugal Fan

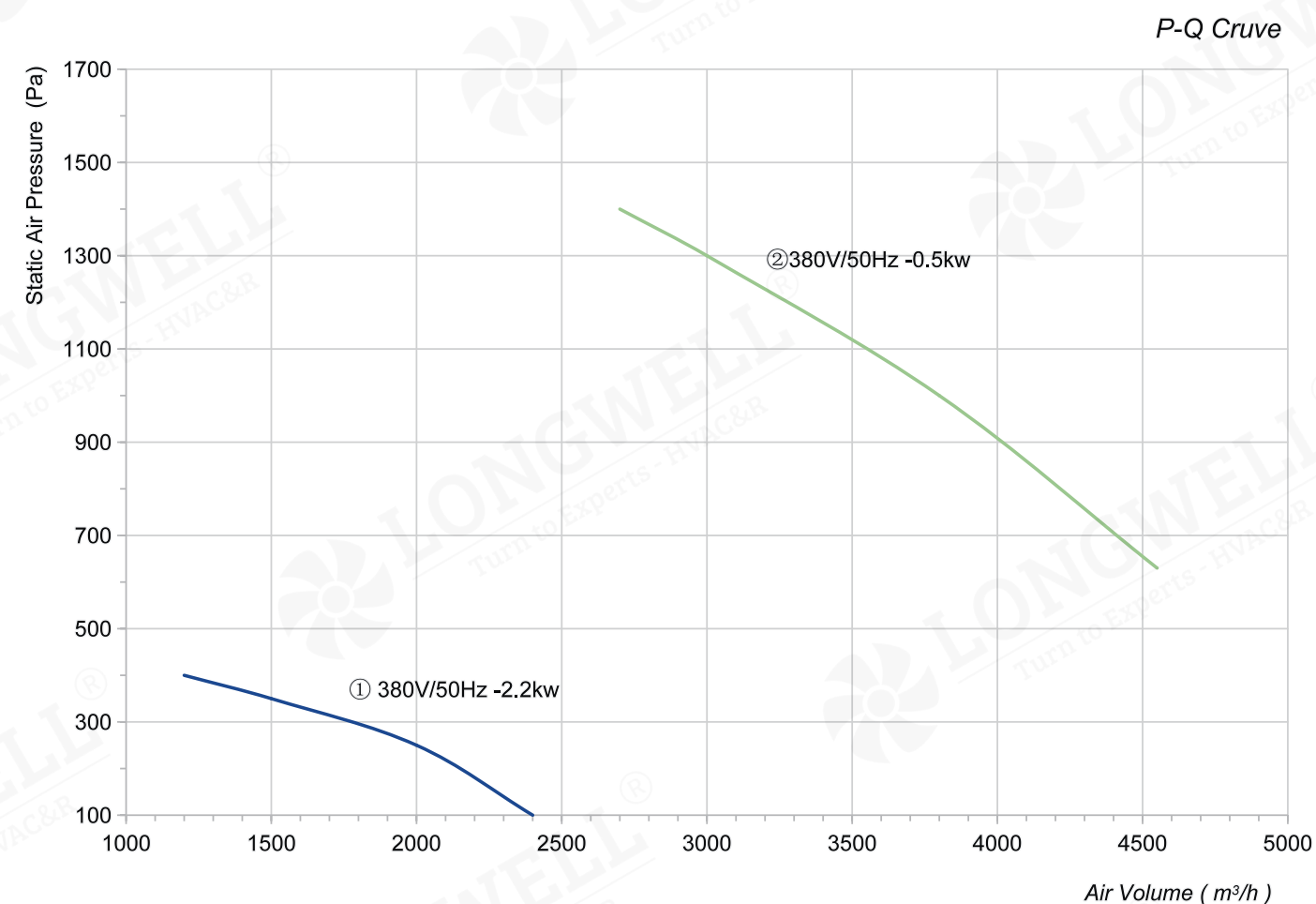
Product Characteristic

- Train Types: Urban rail transit
- Product Code: /
- Material: Q345/5754
- Protection Class: IP56
- Insulation Class: H
- Weight: 33kg
- Application Units: Urban rail traction and auxiliary inverter

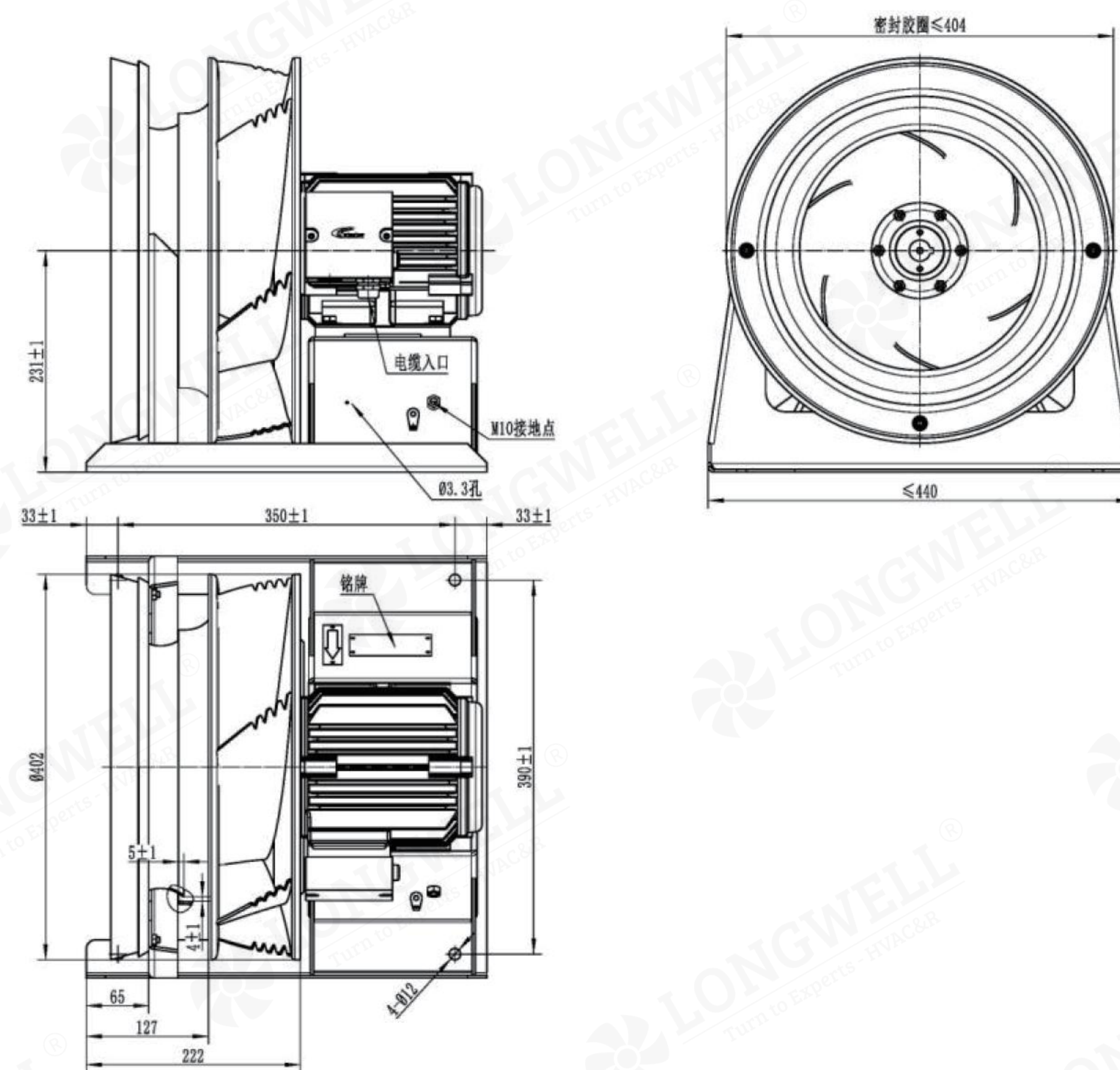


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (kW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBA(RT)400-NW-01	380V	50	2.2/0.5	5/1.3	3600/1800	J1200/300	2850/1450	Lw≤90/78



Product Drawing (mm)



Backward curved centrifugal Fan

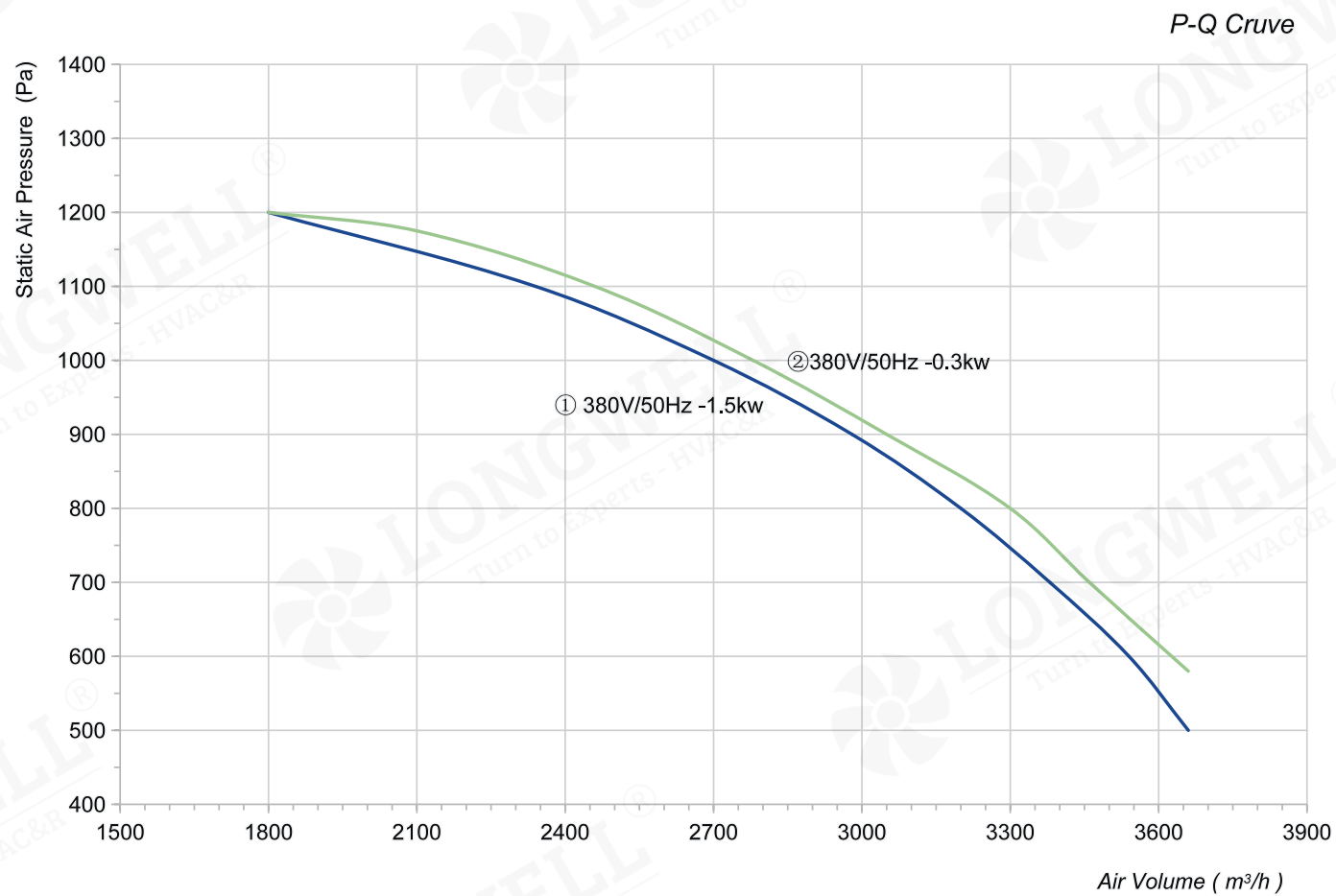
Product Characteristic

- Train Types: Urban rail transit
- Product Code: /
- Material: 5754
- Protection Class: IP65
- Insulation Class: F
- Weight: 24kg
- Application Units: Traction Units heat-dissipation fan

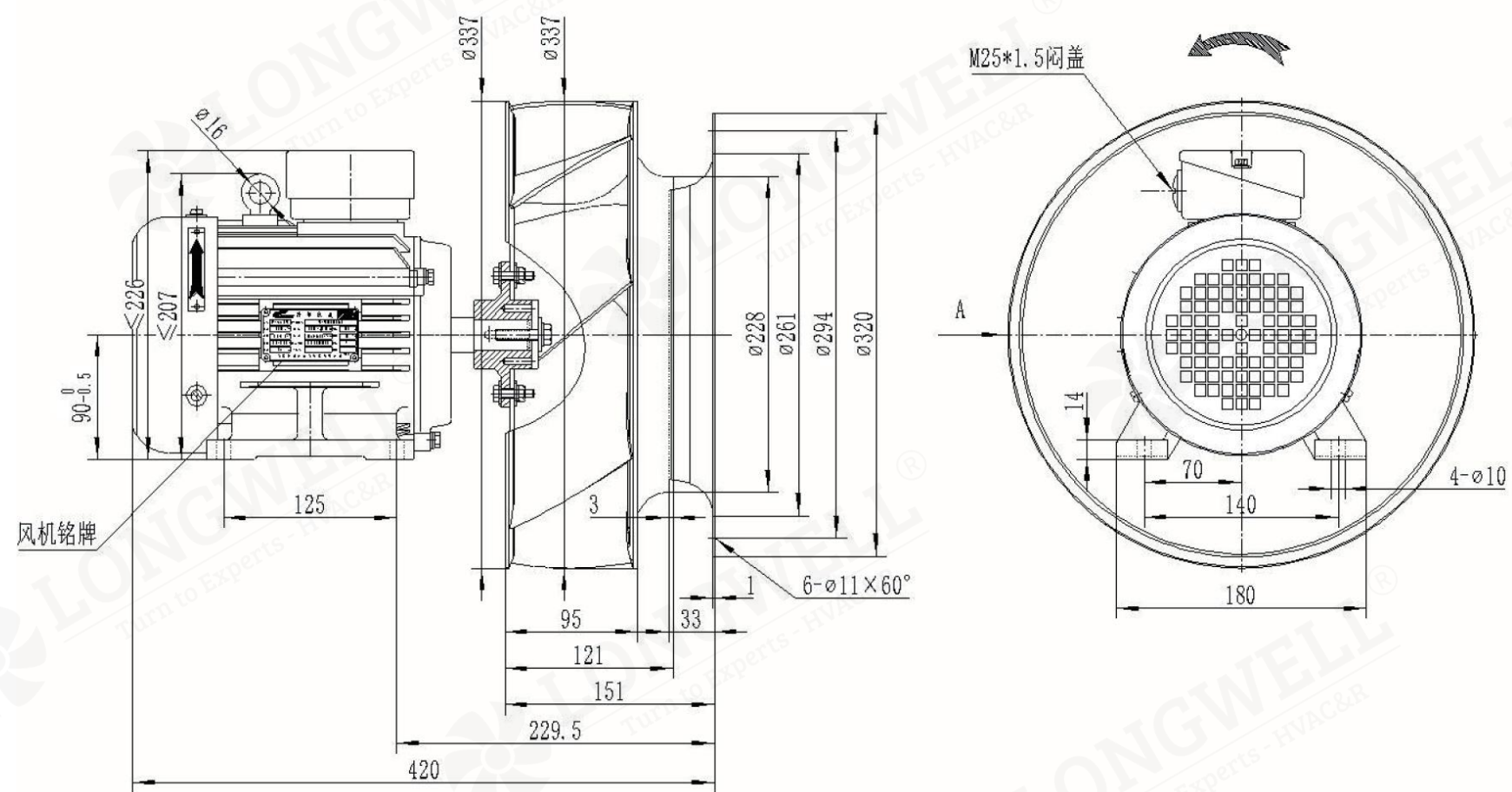


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (kW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBA(RT)320-NW-06	380V	50	1.5/0.3	3.6/0.78	2700	J900	2840/1450	Lw≤88/73



Product Drawing (mm)



Backward curved centrifugal Fan

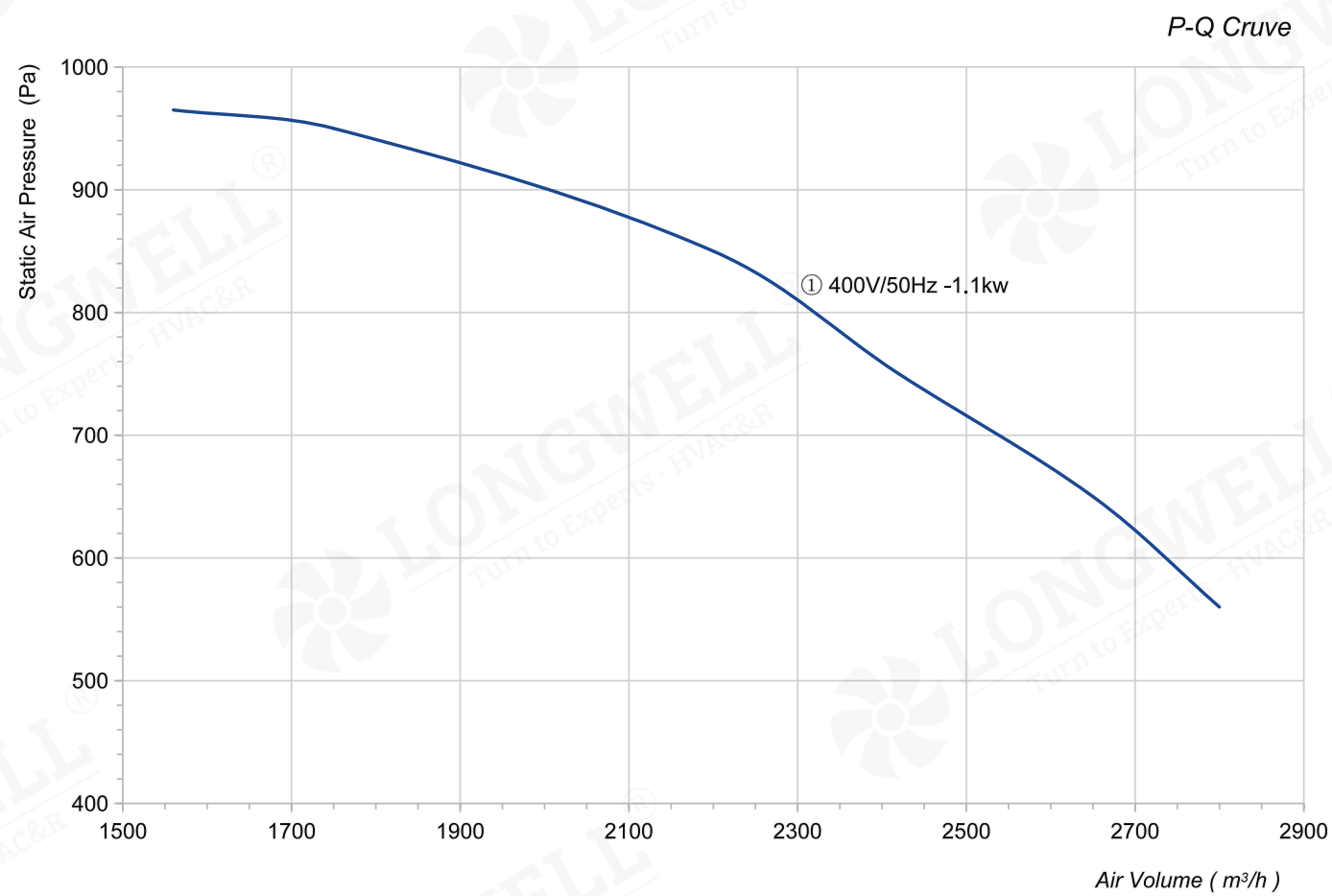
Product Characteristic

- Train Types: Urban rail transit
- Product Code: /
- Material: Q235B
- Protection Class: IP55
- Insulation Class: F
- Weight: 20kg
- Application Units: Traction Units heat--dissipation fan

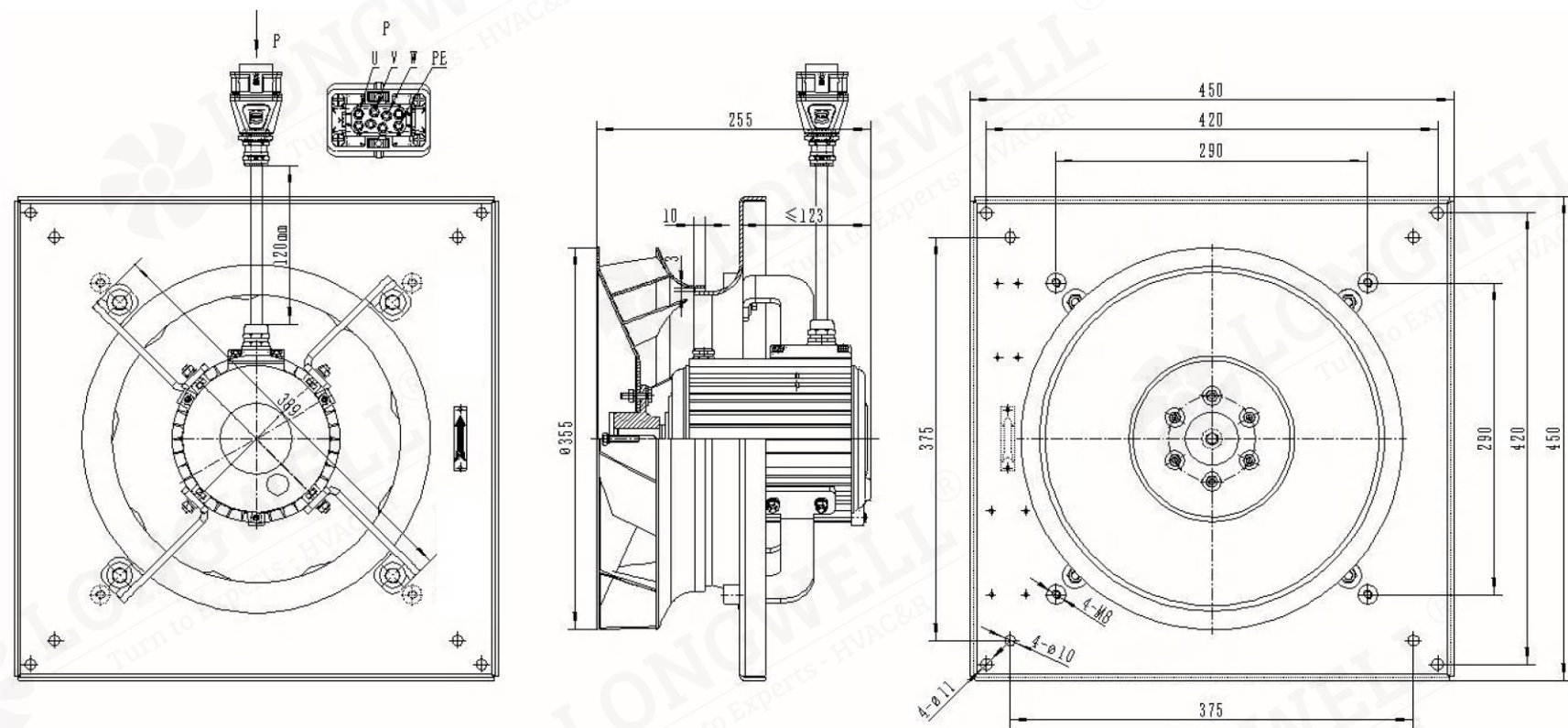


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (kW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBA(RT)355-PW-02	400V	50	1.1	2.4	2160	J765	2845	78



Product Drawing (mm)



Backward curved centrifugal Fan

Product Characteristic

- Train Types: Urban rail transit
- Product Code: /
- Material: 5754
- Protection Class: IP55
- Insulation Class: F
- Weight: 17kg
- Application Units: Traction Units heat-dissipation fan

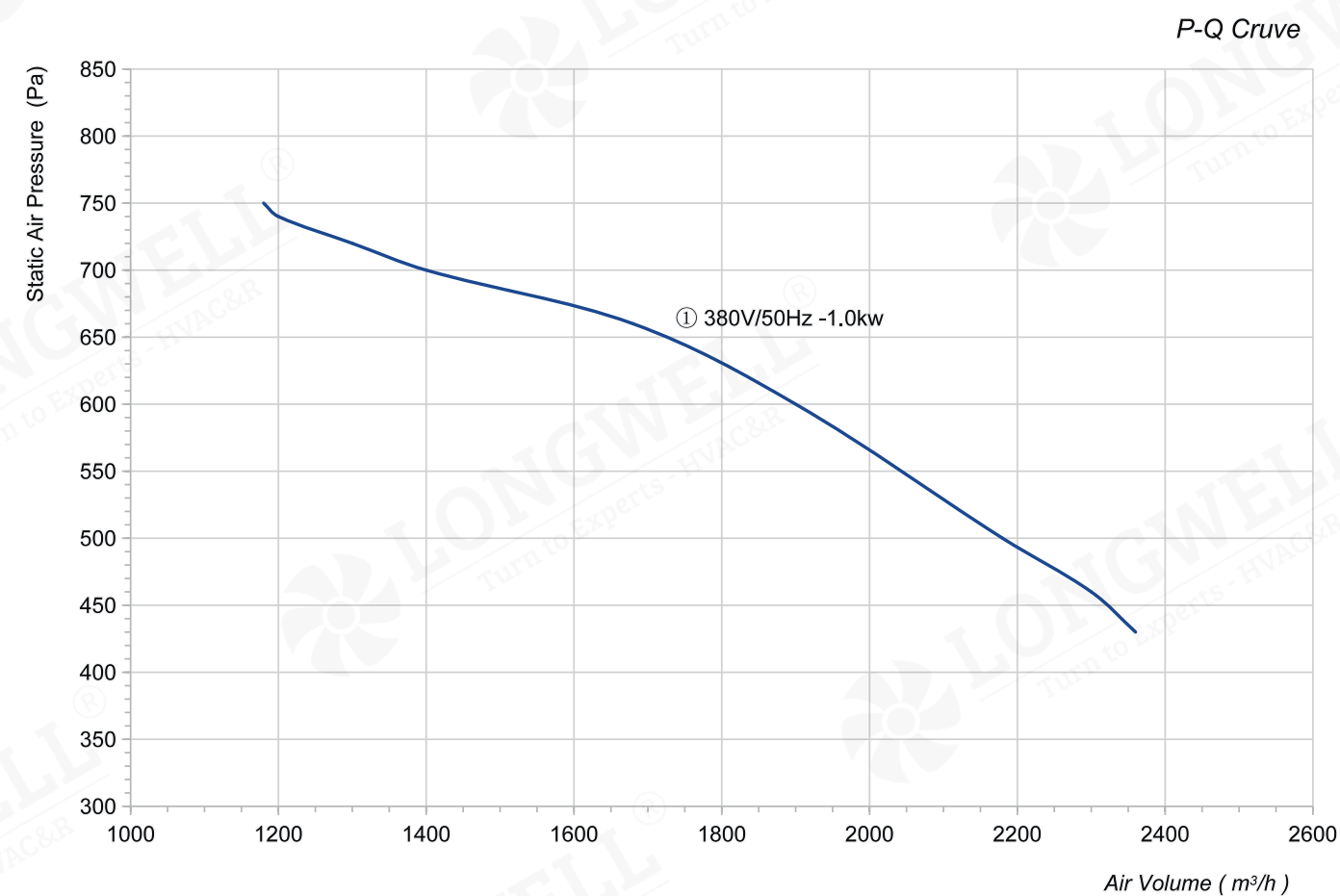
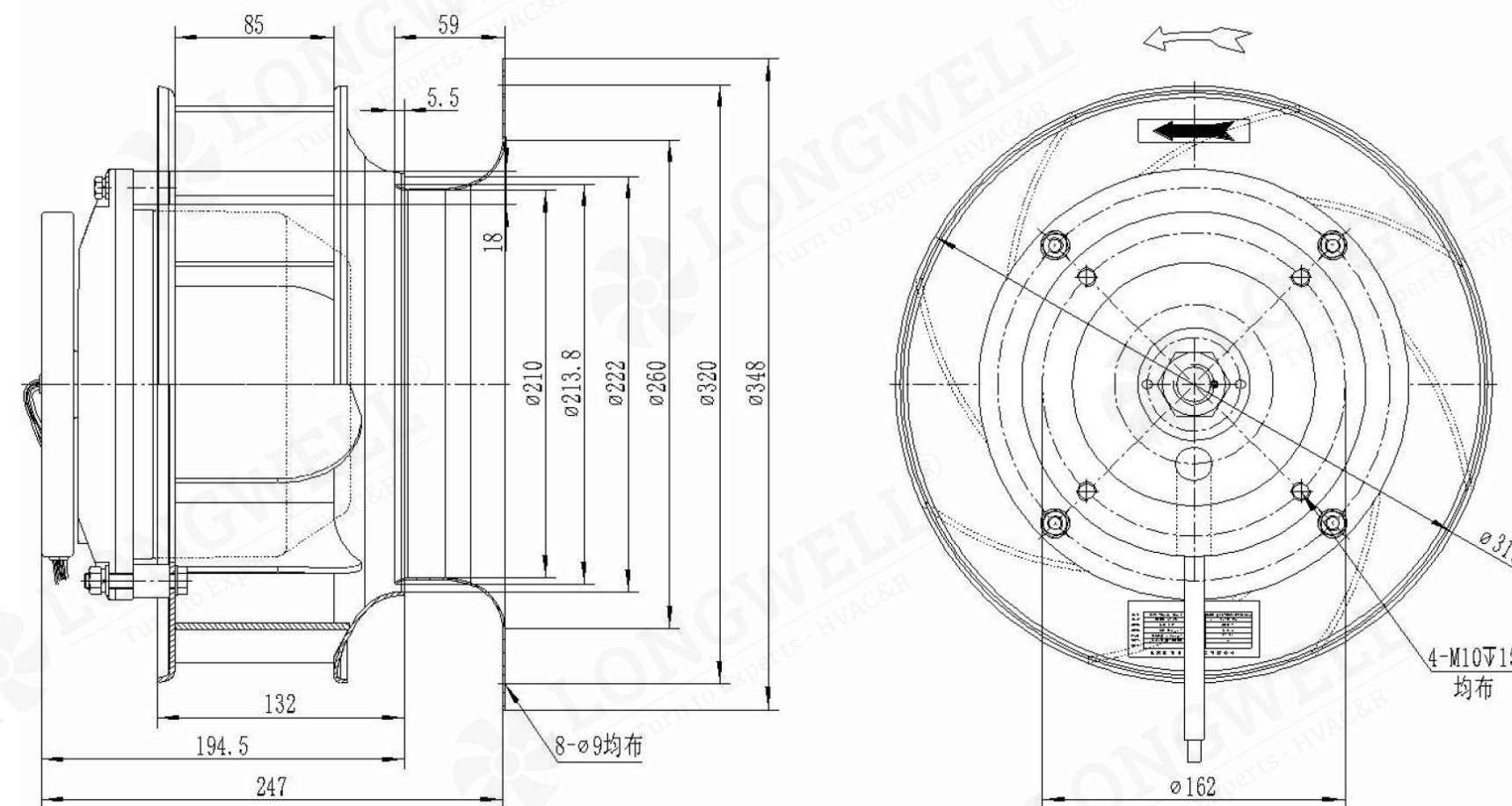


Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (kW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBA(RT)320-NW-08	380V	50	1	1.7	1800	J470	2400	Lw≤81



Product Drawing (mm)



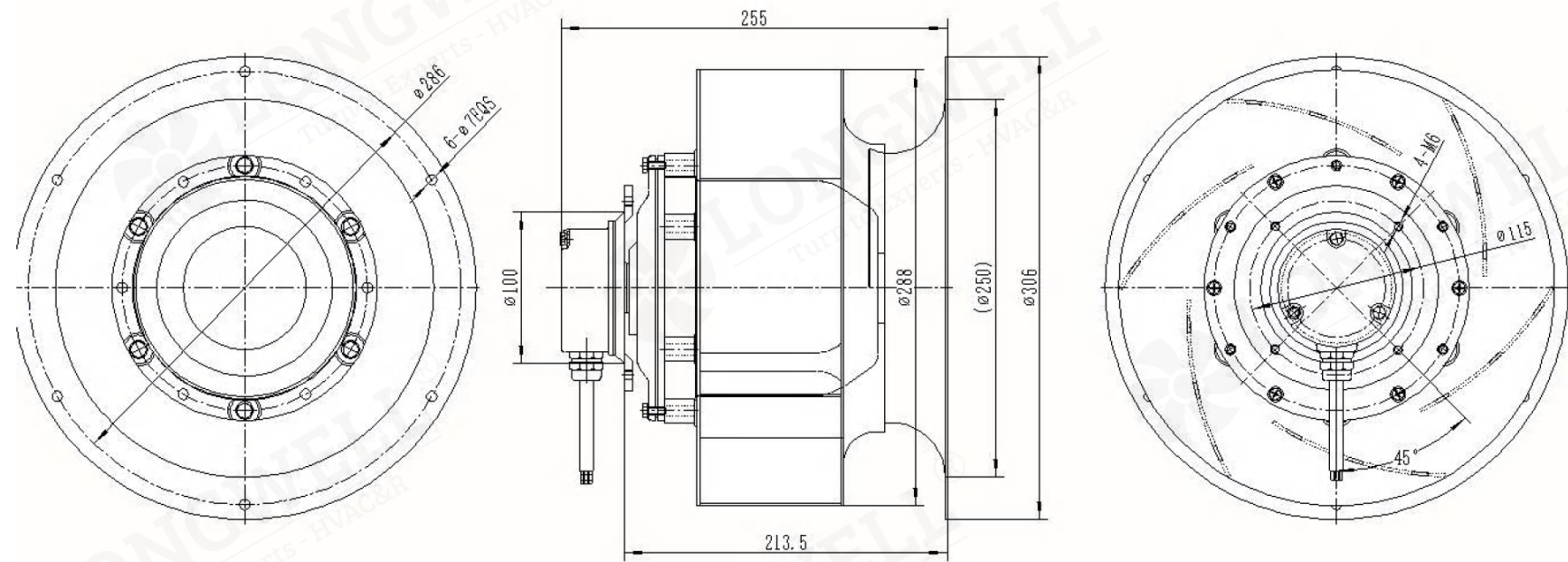
Backward curved centrifugal Fan

Product Characteristic

• Train Types:	Locomotive
• Product Code:	/
• Material:	5754
• Protection Class:	IP55
• Insulation Class:	F
• Weight:	14kg
• Application Units:	Locomotive filter units



Product Drawing (mm)



Technical Specifications

Model	Voltage (V)	Frequency (Hz)	Input Power (kW)	Current (A)	Air Flow (m³/h)	Air pressure (Pa)	Speed (RPM)	Noise [dB(A)]
LWBE(RT)280-NW-02	460V	60	1.2	1.7	2100	J600	3320	Lw≤88

