

INVERTER DRIVE & CONTROL SOLUTION

变频驱动与控制解决方案

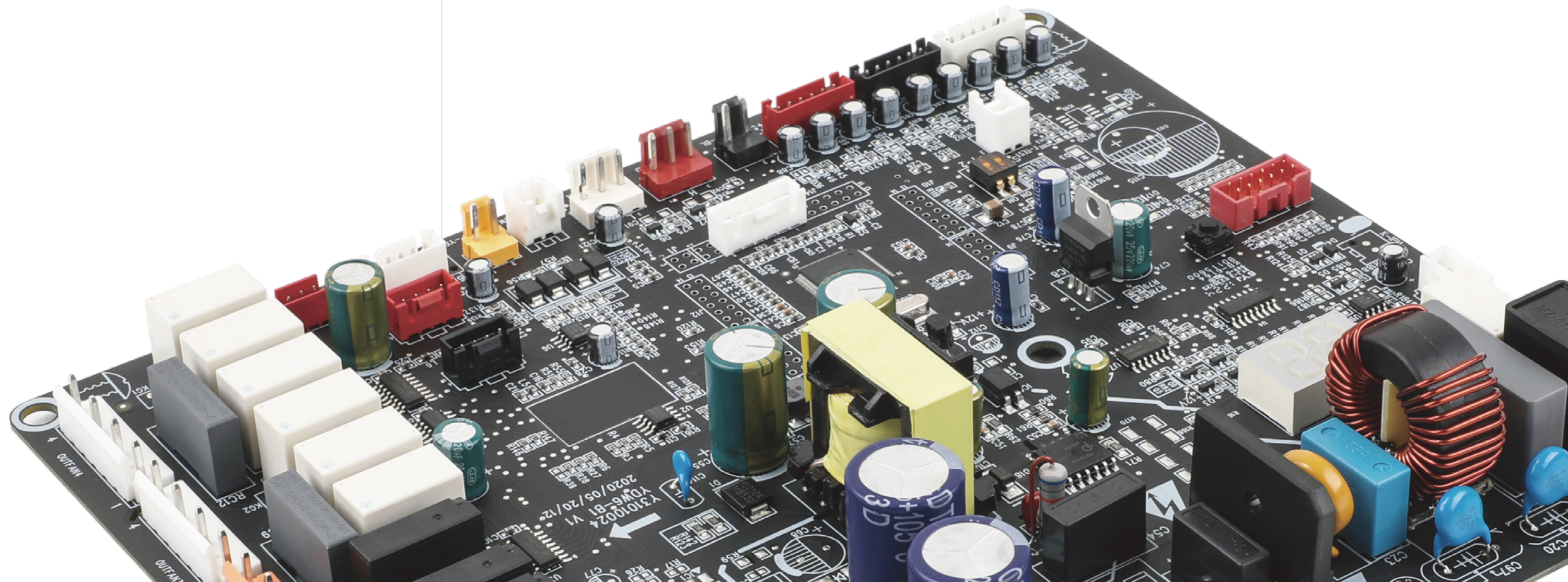
INVERTER DRIVE & CONTROL SOLUTION

HVAC领域变频驱动及智能控制方案

Empower the HVAC Industry

拥有超过 20 年的 HVAC 行业控制领域经验

Over 20 years experience in HVAC control systems



亚丁总部
AdenTech Headquarters

亚丁科技

ADEN TECHNOLOGY

亚丁科技是一家创新性技术驱动型企业，成立于2016年，致力于为全球暖通空调及储能企业提供安全稳定、高效节能的变频驱动器及智能控制解决方案。

公司拥有员工200余人，其中工程师超过110名，核心技术团队均来自全球500强企业，拥有超过20年的行业经验。能够从研发到生产为客户提供全方位产品及技术服务，覆盖家用商用空调，热泵采暖、新风系统，空气净化器，除湿机、特种空调、储能基站设备等。产品均经过长期严苛的极限测试，能兼容多种压缩机、风机及系统方案，满足多种应用场景需求。

2024年，亚丁荣获国家高新技术企业和省级专精特新企业称号，目前公司产品及服务已销售至全球30多个国家和地区。

未来，亚丁将深耕暖通空调领域的技术迭代，同时大力拓展新能源领域的产品研发，为行业伙伴提供绿色、高效、可持续发展的解决方案。

ADENTECH is an innovative, technology-driven company founded in 2016, dedicated to providing safe, stable, and energy-efficient inverter drives and intelligent control solutions for the HVAC and energy storage industries.

ADENTECH employs over 200 people, including more than 110 engineers. Our experts bring over 20 years of experience, having previously worked in Fortune 500 companies, where they gained extensive expertise in servicing global brands. With this in-depth industry knowledge, they are able to provide comprehensive product and services, from R&D to production, ensuring tailored solutions that meet the needs of each customer.

Our products include residential and commercial air conditioning, heat pump heating, ventilation systems, air purifiers, dehumidifiers, specialty air conditioners, and energy storage equipment. All products undergo rigorous, long-term testing to ensure compatibility with various compressors, fans, and system solutions.

In 2023, ADENTECH was recognized as a National High-tech Enterprise and a Provincial-level Specialized and Innovative Enterprise. Our products and services are now available in over 20 countries and regions around the world.

Looking ahead, ADENTECH will continue to focus on advancing technology in the HVAC sector while expanding into the new energy field, providing green, efficient, and sustainable solutions for industry partners.



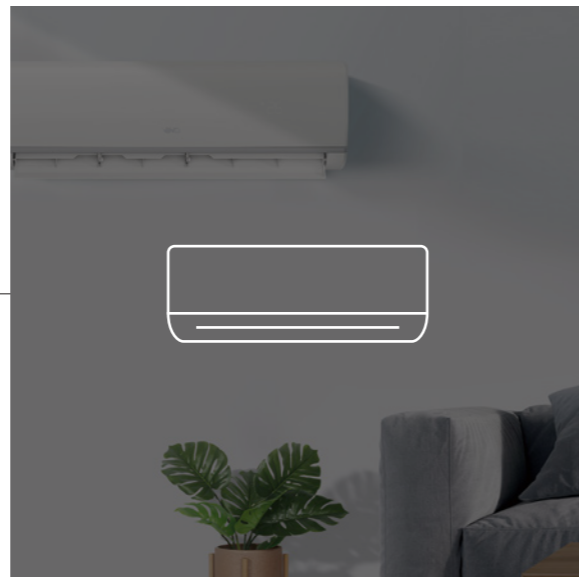
合作客户 遍布全球

Global Cooperation
Partners

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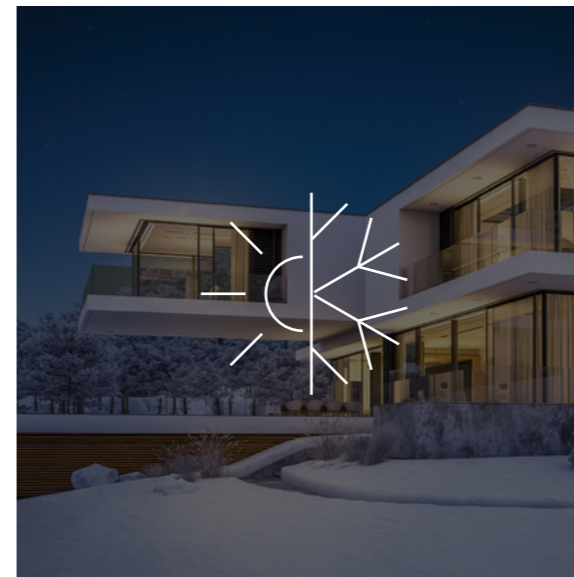
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01

ADENTECH

变频压缩机驱动

INVERTER DRIVE COMPRESSOR

凭借长期的应用实践与持续的升级迭代，亚丁的压缩机驱动技术具备宽电压、宽频率适应性及快速响应能力，确保产品在各种复杂工况下的优异表现。经过极限环境与高温测试，结合完善的故障保护系统，亚丁驱动在保障稳定性、可靠性、安全性与高效性的同时，适用于多种工作场景，满足不同需求。

此外，亚丁驱动能够兼容多种品牌压缩机，轻松实现精准选型，帮助客户提升系统整体效能。

ADENTECH's in-house developed compressor drive technology offers wide voltage and frequency adaptability, along with fast response times, ensuring reliable performance in various conditions.

Thoroughly tested in extreme environments and equipped with comprehensive fault protection, ADENTECH drive is able to provide stability, safety and energy efficiency across a range of applications.

Compatible with multiple compressor brands, ADENTECH drives make selection easy and help optimize system performance.





特点 / Features

高效节能 / High efficiency energy saving



电流控制策略

Permanent magnet synchronous motor

适用于永磁同步电机，最大转矩电流比控制技术，更高的效率

Advanced Maximum Torque Per Ampere (MTPA) technology Adopted to obtain higher efficiency



新型空间矢量调制 (SVPWM) 技术和过调制 (Over modulation) 技术
New space vector modulation & over modulation technology

结合新型的空间矢量调制和过调制技术，降低驱动开关损耗

Combined with New space vector modulation & over modulation technology reduce the switching loss of the driver



弱磁控制技术

Weakening magnetic control (Flux weakening) technology

压缩机可运行到更高的转速，拓宽压缩机转速运行范围
弱磁区域压缩机转速无波动，电流无震荡，动态响应快

Compressor runs to a higher speed and expand the speed range

No fluctuation of compressor speed and current in the weak magnetic area
fast dynamic response



低频转矩补偿技术

Low frequency torque compensation technology

得益于低频转矩补偿技术，压缩机可稳定运转于低频，温度控制更加精确，更加舒适和节能

Thanks to low frequency torque compensation technology, the compressor can operate stably at ow-frequency, and the temperature controller is more accurate, more comfortable and energy-saving

品质可靠 / Reliable quality



宽电压范围运行

Wide voltage operatio

单相: Single phase 140V-265V

三相: Three phase 304V-460V



极限环境温度运行

Extreme ambient temperature operation

超高60°C和极低-30°C环境温度运行

Reliable operation under ultra high 60°C and ultra low -30°C



自适应限频、降频功能

Adaptive frequency limit and reduction



完善的故障保护功能

Perfect the fault protection function

具有过/欠压、过流、过热、防雷、抗冲击等保护功能

Over high / low voltage, over current, over temperature, lightning, resistance impact and other protection

应用方便 / Application convenient

标准化

Standard

采用标准Modbus 通讯协议
Standard Modbus
communication protocol

自动化

Flexible

同一驱动
可自动匹配多款压缩机
One drive Matches
with multiple compressors

体积小

Compact

集成设计,体积小,
安装使用方便
Integrated design, small size,
easy installation and use

核心技术 / Core Technology

1 最大转矩电流比控制技术 (MTPA) Maximum Torque Current Rate Control Technology(MTPA)

- 永磁同步电机因转子结构差异分为：隐极永磁同步电机 ($L_q = L_d$) 和凸极永磁同步电机 ($L_q > L_d$)

Permanent magnet synchronous motor is divided into: hidden pole permanent magnet synchronous motor ($l_q = l_d$) and convex pole permanent magnet synchronous motor ($l_q > l_d$)

- 凸极永磁同步电机 ($L_q > L_d$) 因转子磁路不对称形成磁阻转矩

根据电机转矩公式： $T_e = \frac{3}{2} P [K_e i_q + \frac{(L_d - L_q)}{2} i_d i_q]$

永磁转矩
磁阻转矩

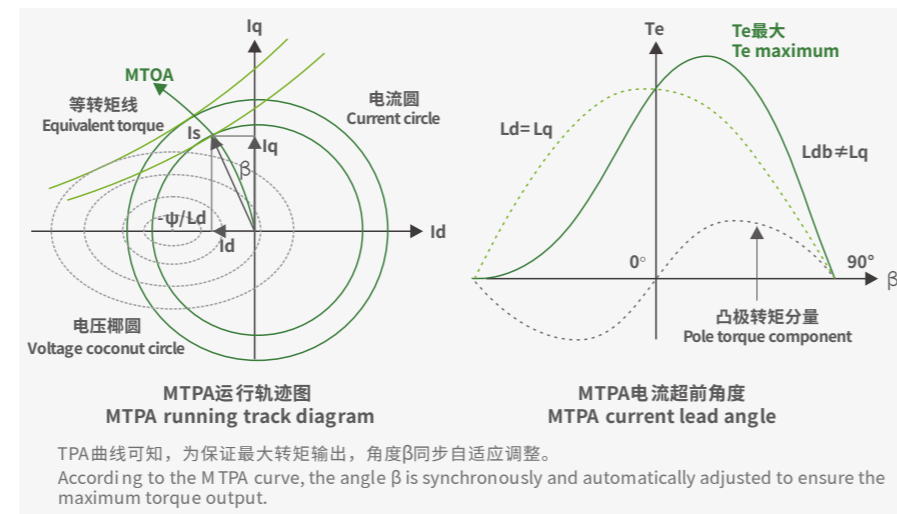
Convex pole permanent magnet synchronous motor ($L_q > L_d$) due to the rotor magnetic circuit asymmetry formed magnetic resistance torque according to the

motor torque formula: $T_e = \frac{3}{2} P [K_e i_q + \frac{(L_d - L_q)}{2} i_d i_q]$

permanent magnet torque
reluctance torque

为了让最小电流产生最大的转矩，必须充分利用磁阻转矩。设定最大转矩时，电流超前角度为 β 。

In order to produce the maximum torque of the minimum current, the magnetic resistance torque must be fully utilized. When the maximum torque is set, the current lead angle is β .



2 空间矢量脉宽调制 (SVPWM) 及三次谐波注入技术 Spatial vector pulse width modulation (SVPWM) and thirdharmonic injection technology

- 相对传统的正弦脉宽调制 (SPWM)，采用7段式电压空间矢量脉宽调制 (SVPWM) 具有以下优点：

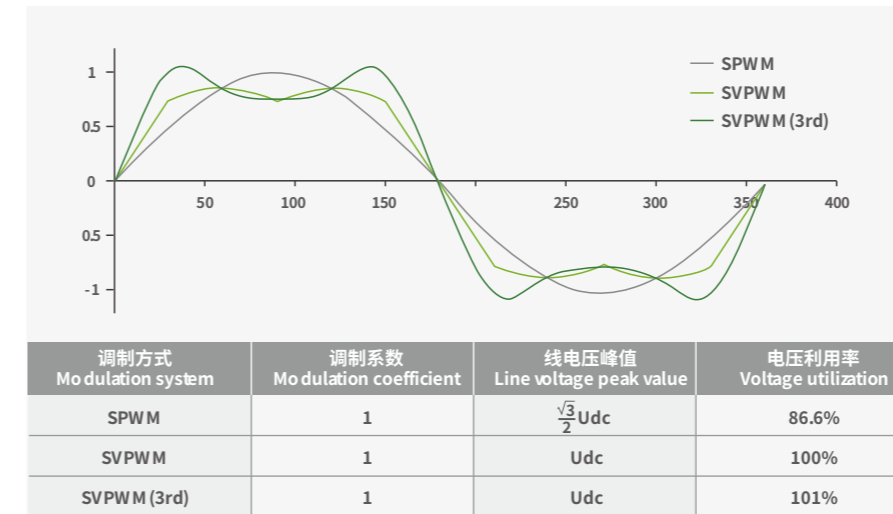
- (1) 基本矢量对称输出减少电流谐波分量
- (2) 零矢量的分散分布减小了电机绕组的电流脉动
- (3) 非零矢量的分散分布减小了电压空间矢量的抖动

Compared to conventional sinusoidal pulse width modulation (SPWM), the 7-segment voltage-space vector pulse width modulation (SVPWM) offers the following advantages:

- (1) The symmetric output of the basic vector reduces current harmonic distortion.
- (2) The dispersion of the zero vector reduces current pulsation in the motor windings.
- (3) The dispersion of the non-zero vectors reduces voltage space vector jitter.

- 三次谐波注入技术，提高输出电压，减小电机电流，减少整体损耗，提升效率

Triple harmonic injection technology, improve the output voltage, reduce the motor current, reduce the overall loss, improve the efficiency



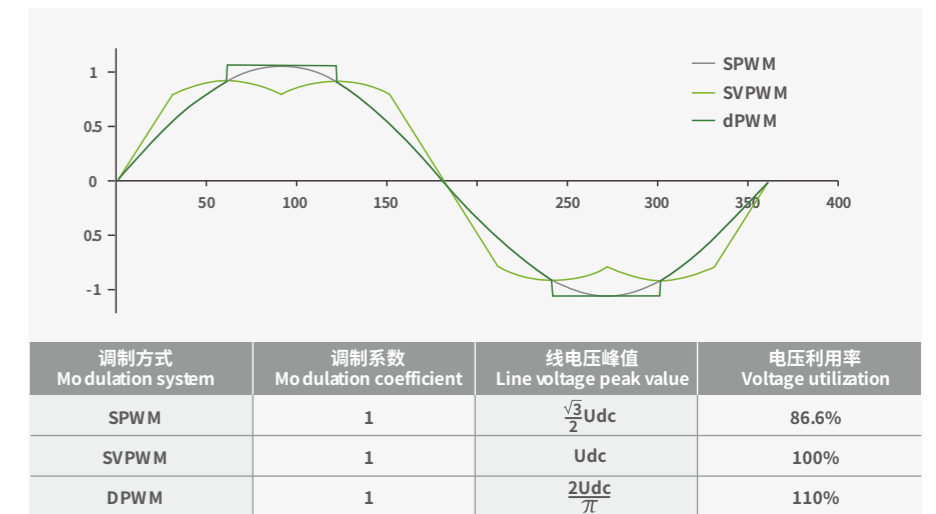
3 过调制控制技术 Overmodulation control technology

为进一步提升直流母线利用率，提高高速弱磁下的压缩机输出功率，扩展电机运转范围，同时兼容电机电流波形的平滑，转速稳定等要求，研究基于数字脉宽调制 (DPWM) 的过调制技术

根据实验得出：
实测波形，三相输入电压380V
电抗器压降35V，母线电压约505V
变频器输出372V，电压利用率104%

In order to further improve the utilization rate of DC bus, improve the output power of compressor under high-speed weak magnet, and expand the operation range of motor, Also compatible with the requirements of motor current waveform smoothing and speed stability, based on digital pulse width modulation (DPWM) Over-modulation technology of Measured waveform.

According to the experiment:
With a three-phase input voltage of 380V
The reactor voltage drop is 35V, the bus voltage is about 505V
The inverter output is 372V, and the voltage utilization rate is 104%



4 自适应弱磁控制技术 Maximum Torque Current Rate Control Technology (MTPA)

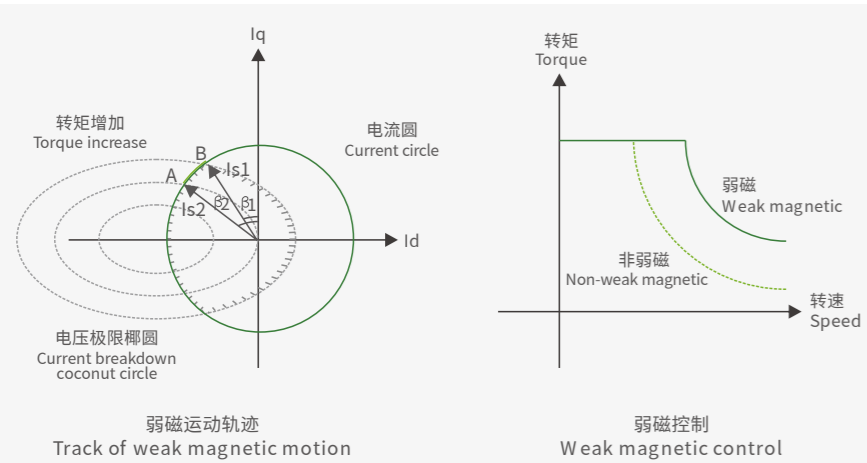
- 相当电机端电压达到最大电压时，只能通过降低电动机的励磁电流，改变励磁磁通，才能运行于更高的转速

When the motor end voltage reaches the maximum voltage, it can only operate by reducing the excitation current of the motor and changing at a higher speed

- 电机电流包括：转矩电流 (Iq) 和励磁电流 (Id)
当转速 $\omega\omega_1$ 增加 $\omega\omega_2$ ，定子电流轨迹由B (Is1) 到A (Is2)，对应转矩角 $\beta\beta_1$ 和 $\beta\beta_2$ ， $\beta_2 > \beta_1$ 随着转速增加，进入弱磁区域，电机输出转矩变小

Motor current includes: torque current (Iq) and excitation current (Id)

When the rotation speed is increased from $\omega\omega_1$ to $\omega\omega_2$, the stator current track is changed from B (Is1) to A (Is2), with the corresponding torque angles of $\beta\beta_1$ and $\beta\beta_2$, and $\beta\beta_2 > \beta\beta_1$ As the speed increases, entering the weak magnetic area, the motor output torque becomes smaller



进入弱磁区域后，为保证电机能运行于更高转速且保持稳定，角度 β 同步自适应调整。
After entering the weak magnetic area, the angle β adjusts synchronously to ensure that the motor can operate at higher speeds and remain stable.

5 自适应转矩补偿技术 Adaptive torque compensation technology

- 单转子压缩机只有一个气缸，旋转一周有一次吸取和一次排气过程；吸气吸收的是低压气体，排气排出的是压缩后的高压气体，因此旋转一周转矩并不均匀

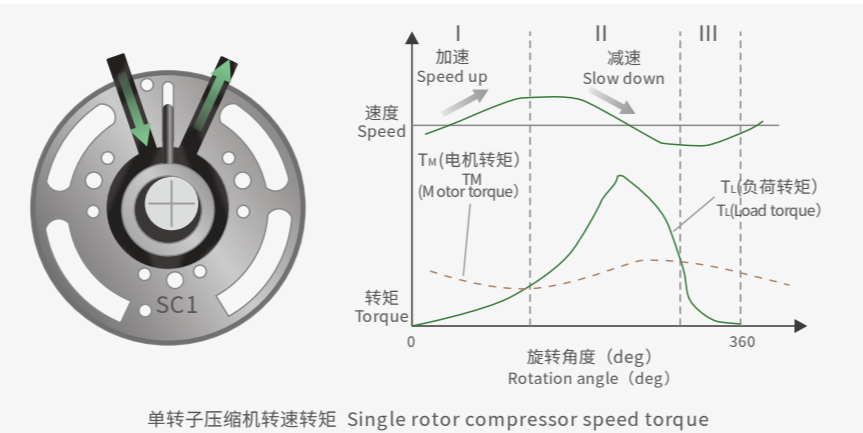
Single rotor compressor has only one cylinder, rotating once a week and once exhaust process; the suction absorbs low pressure gas, the exhaust exhaust is compressed high pressure gas, so the rotation torque is not uniform

- 传统的恒转矩控制方法在一周内输出近视恒定的电机转矩，与负荷转矩并不匹配，导致在转动的一周内会有加速和减速产生转速波动，如右图，从而导致压缩机产生振动和噪音问题

The traditional constant torque control method outputs myopic constant motor torque within a week, which does not match the load torque, resulting in acceleration and deceleration in a week of rotation, such as the figure on the right, resulting in vibration and noise problems of the compressor

- 自适应转矩补偿技术打破常规恒转矩控制输出恒定电机转矩的控制方法，根据压缩机在一周内的负荷转矩变化输出与之匹配的电机转矩，从而保证在一个运转周期内转速均匀，抑制压缩机由于负荷变化导致的转速波动，从而完美解决振动和噪音问题

Adaptive torque compensation technology to break the conventional constant torque control output constant motor torque control method, according to the compressor in a week of load torque change output matching motor torque, so as to ensure the uniform speed in a running cycle, inhibit the compressor speed fluctuations caused by load changes, to perfectly solve the problem of vibration and noise



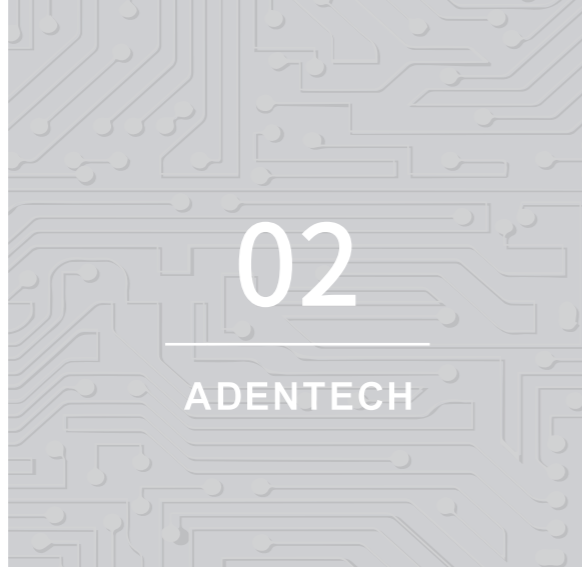
单转子压缩机转速转矩 Single rotor compressor speed torque

启动后检测负荷转矩情况自动施加转矩补偿实现平稳过渡；
运行过程中根据压缩机负荷转矩的变化自动施加相匹配的转矩补偿量。
Detects the load torque after startup and automatically applies the torque compensation to achieve a smooth transition;
During the operation process, the matching torque compensation amount is automatically applied according to the change of the compressor load torque.



参数规格 / Parameter

产品类型 Category	单相 1 Phase						三相 3 Phase					
型号 Model	D01-BDQ35A2F2	D02-BDQ50A1F3	D03-BDQ72A1F2	D04-BDQ100C1F1	D06-BDQ175B1F2	D07-BSQ180F1	D07-BSQ180B2	D10-BSQ250B1	D12-BSQ280B1	D16-BSQ450B1	D20-BSQ560A1	D25-BSQ700A1
机组制冷量 Unit Cooling Capacity	1HP	2HP	3HP	4HP	5~6HP	4~5P	4~7HP	10HP	8~12HP	13~16HP	17~20HP	20~25HP
机组制热量 Unit Heating Capacity	1~2HP	2~3HP	3~4HP	4~5HP	6~7HP	5~6P	7~8HP	10HP	12~16HP	17~20HP	21~25HP	25~30HP
工作电压范围 Operating voltage range	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	380V ± 20%	380V ± 20%	380V ± 20%	380V ± 20%	380V ± 20%	380V ± 20%	380V ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	9A	12A	17A	23A	29A	13A	17A	20A	25A	33A	42A	50A
最大输入功率 Max Input Power	1.97KW	2.6kW	3.8kW	5kW	6.5kW	7kW	10kW	12kW	15kW	20kW	25kW	25kW
最大输出电流 Max Output Current	7A	10A	14A	18A	25A	16A	20A	22A	32A	40A	55A	65A
功能接口 Function Interface	压缩机+内置驱动器 直流风扇*1+STO Compressor+Built in driver DC FAN*1+STO	压缩机+内置驱动器 直流风扇*1+STO Compressor+Built in driver DC FAN*1+STO	压缩机+内置驱动器 直流风扇*1+STO Compressor+Built in driver DC FAN*1+STO	压缩机+内置驱动器 直流风扇*2+STO Compressor+Built in driver DC FAN*2+STO	压缩机+内置驱动器 直流风扇*2+STO Compressor+Built in driver DC FAN*2+STO	压缩机+内置驱动器 直流风扇*2+STO Compressor+Built in driver DC FAN*2+STO	压缩机+STO Compressor+STO	压缩机+STO Compressor+STO	压缩机+STO Compressor+STO	压缩机+STO Compressor+STO	压缩机+STO Compressor+STO	压缩机+STO Compressor+STO
通讯接口 Communication Interface	RS-485	RS-485	RS-485	RS-485	RS-485(Need+5VCC)	RS-485	RS-485	RS-485	RS-485	RS-485	RS-485	RS-485
尺寸 Size (mm)	182*164*89	182*164*105	182*164*105	214*205*117	276*177*135	276 * 177*137	276*177*149	230*200*147	244*200*140	264*205*146	270*229*146	290*229*146
冷却形式 Cooling Mode	风冷 Air-cooled	风冷 Air-cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled	风冷/制冷剂冷却 Air-cooled/ Refrigerant cooled
工作温度 Ambient Temp	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
最大储存湿度 Max. Storage Relative Humidity	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
电磁兼容认证 EMI Certificaiton	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014	EN 55014
谐波认证 Harmonic Certificaiton	EN 61000	EN 61000	EN 61000	EN 61000	EN 61000	EN 61000	EN 61000(Passive PFC)	/	/	/	/	/
保护功能 Protection	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch	电压/电流/温度/压力开关 Voltage/Current/Temp./ Pressure Switch
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分体式空调产品控制解决方案

DRIVE & CONTROL SOLUTION FOR SPLIT TYPE AC

亚丁科技专注于分体空调控制技术，依托20年的行业经验，为客户提供经过市场验证的成熟方案。

我们的控制解决方案已成功应用于上千万台产品，始终保持稳定可靠的性能表现。

凭借多样化的灵活功能和持续的技术优化，我们的控制方案不仅助力合作伙伴打造差异化产品，还致力于引领技术创新，助力客户在激烈的市场中脱颖而出。

ADENTECH specializes in advanced split air conditioning control technologies, With 20 years of industry expertise, AdenTech delivers reliable, market-tested solutions designed to meet customer needs. Our control solutions have been successfully implemented in tens of millions of products, ensuring durable and reliable performance. With versatile features and ongoing technical refinement, our solutions empower partners to create differentiated products, enhance market competitiveness, and drive innovation across the HVAC industry.



产品系列 / Product Series

- 挂机空调控制器
Split AC Controls
- 柜机空调控制器
Floor standing AC Controls
- 天井式空调控制器
Cassette AC Controls
- 风管式空调控制器
Ducted AC Controls
- 座吊式空调控制器
Floor Ceiling AC Controls

特点 / Features



自主知识产权的控制算法
Patented control algorithms



高频PFC功率因数>0.99
High efficiency PFC, power factor>0.99



倒扣防尘紧凑设计
Undercut dust prevention design



全方位保护功能
Full protection



低频平顺运行
Low frequency smooth running



超宽频精准运行
Ultra-wide frequency accurate running



云智能控制技术
Cloud intelligent remote control technology



宽工作电压范围
Wide voltage range 140V-265V (50/60Hz)

参数规格 / Parameter 外机 Outdoor Unit

产品类型 Category	单元式外机 Unitary Outdoor Unit							
型号 Model	BW26A*	BW26*/BW35*	BW50*	BW72*	BW100A*+BDQ100A*	BW100A*+BSQ140A*	BW175A*+BDQ175A*	BW175A*+BSQ180B*
适用能力 Capacity	2.6 ~ 3.5kW	2.6 ~ 4.1kW	5 ~ 6.5kW	7.2 ~ 8kW	10 ~ 12kW	10 ~ 12kW	10 ~ 16kW	10 ~ 16kW
工作电压范围 Operating Voltage Range	115V ± 10%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	380 ± 20%	220VAC ± 20%	380 ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	11A	8A	12A	16A	23A	11A	34A	15A
最大输入功率 Max Input Power	1200W	1760W	2640W	3520W	5500kW	6500kW	7500kW	9000kW
最大输出电流 Max Output Current	8A	8A	12A	16A	15A	16A	22A	23A
工作温度 Ambient Temp	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
通讯方式 Communication Mode	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled
冷却形式 Cooling Mode	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication
输入参数 Input	压缩机过载保护开关、排气感温包、管温感温包、环境感温包 Compressor overload protection switch, Discharge temp sensor, tube temp. sensor, Ambient temp. sensor				高压开关、低压开关、压缩机过载保护开关、排气感温包、管温感温包、环境感温包、容量/机型跳线帽 High pressure switch, Low pressure switch, Compressor overload protection switch, Discharge temp sensor, tube temp. sensor, Ambient temp. sensor, Capacity/Model jumper			
控制对象 Object Control	直流电机 / 交流电机、四通阀、压缩机电加热、底盘电加热 DC motor / AC motor, 4-way valve, Compressor electric heater, Chassis electric heater				直流电机 / 交流电机、四通阀、电子膨胀阀、压缩机电加热、底盘电加热 DC motor / AC motor, 4-way valve, EEV, Compressor electric heater, Chassis electric heater			

功能点 / Functions



低功耗待机0.5w
Low power standby 0.5w



掉电记忆
Power-off memory



快速制冷制热
Fast heating/cooling



智能化霜
Intelligent defrost



智能Wi-Fi
Smart Wi-Fi (Optional)



冷等离子
Cold plasma (Optional)



低温制热 -25°C
-25°C low temperature heating (optional)



低温制冷 -15°C
-15°C low temperature cooling (optional)



自诊断功能
Self-diagnostic function

解决方案 / Solution



内机 Indoor unit

产品类型 Category	壁挂 Split Type	柜机 Floor Standing	风管 Duct Unit	天井 Cassette	座吊 Floor Ceiling
型号 Model	BNF35*	BNL120A*	BNG175A*	BNT160A*	BNL160A*
适用能力 Capacity	2.6 ~ 7.2kW	7.2 ~ 16kW	2.6 ~ 16kW	7.2 ~ 16kW	5 ~ 16kW
工作电压范围 Operating voltage range	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
工作温度 Ambient Temp	0 ~ 60°C	0 ~ 60°C	0 ~ 60°C	0 ~ 60°C	0 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
内外机通讯方式 Communication mode	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication
输入参数 Input	线控器(遥控器)、水位开关、环境感温包、管温感温包、门禁、Wi-Fi、跳线帽 Wired controller (Remote controller)、Water level switch、Ambient temp.sensor、Pipe temp. sensor、Gate control、Wi-Fi、Jumper				
控制对象 Object Controller	交流风机/直流电机、扫风电机x2、灯板、电加热 AC motor/DC motor, swing motorx2, displayboard, electrical heater	交流风机/直流电机、扫风电机x2、显示板、电加热 AC motor/DC motor, swing motorx2, displayboard, electrical heater	交流风机/直流电机、交流/12V直流水泵、电加热 AC motor/DC motor, AC/12V DC pump, electrical heater	交流风机、交流水泵、扫风电机x2、灯板、电加热 AC motor, AC pump, swing motorx2, display board, electrical heater	直流风机x2、12V直流水泵、扫风电机x3、灯板、电加热 DC motorx2, 12V DC pump, swing motorx3, display board, electrical heater
组件 Component	主板+灯板+遥控 Mainboard + displayboard + remote Controller	主板+灯板+遥控 Mainboard + displayboard + remote Controller	主板+线控/灯板和遥控 Mainboard + Wired controller /displayboard+remote Controller	主板+线控/灯板和遥控 Mainboard + Wired controller /displayboard +remote Controller	主板+线控/灯板和遥控 Mainboard + Wired controller /displayboard +remote Controller

03

ADENTECH

轻型商用一拖多空调产品控制解决方案

DRIVE & CONTROL SOLUTION FOR LIGHT COMMERCIAL MULTI SPLIT AC

亚丁电控团队自主研发的技术，与合作伙伴的控制技术优势互补，共同成就了亚丁商用产品的卓越控制方案。

这些方案已在超过百万台设备中得到充分验证，表现出卓越的安全性、稳定性与高效性。

产品支持长配管和灵活安装，内机可超配外机150%的能力。外机兼容家用内机及商用末端设备，满足更广泛的用户需求。

ADENTECH's in-house developed multi-split control technology, combined with the strengths of our partners' control solutions, has resulted in an advanced control system for commercial products.

These solutions have been fully validated in over a million units, demonstrating exceptional safety, stability and efficiency.

The system supports long piping and flexible installation, indoor units capable of exceeding 150% of the outdoor unit's capacity. The outdoor units are compatible with both residential indoor units and commercial terminal units, meeting a wide range of customer needs.



产品系列 / Product Series

- 小型一拖多空调控制器
Multi split AC Controls
- 小型VRF空调控制器
Mini-VRF AC Controls

小型一拖多空调控制器 Multi split AC Controls

特点 / Features



自主知识产权的控制算法
Patented control algorithms



高频PFC 功率因数>0.99
High efficiency pfc, power factor>0.99



支持最多可搭配5台不同类型内机
Supports up to 5 different indoor units



倒扣防尘紧凑设计
Undercut dust prevention design



超宽频精准运行
Ultra-wide frequency accurate running



低频平顺运行
Low frequency smooth running



云智能控制技术
Cloud intelligent remote control technology



宽工作电压范围
Wide voltage range
165V - 265V (50/60Hz)



全方位保护功能
Full protection

功能点 / Functions



低功耗待机0.5w
Low power standby 0.5w



掉电记忆
Power-off memory



快速制冷制热
Fast heating/cooling



智能化霜
Intelligent defrost



智能Wi-Fi (optional)
Smart Wi-Fi (optional)



冷等离子 (optional)
Cold plasma (optional)



低温制热 -25°C
Low temperature heating (optional)



低温制冷 -15°C
Low temperature cooling (optional)



超静音功能
Quiet function



故障智能检测
Fault intelligent detection



自诊断功能
Self-diagnostic function



舒适睡眠功能
Comfortable sleep function



随身感功能
I feel function

解决方案 / Solution



参数规格 / Parameter

产品类型 Category	一拖二外机 System 2 CU	一拖三外机 System 3 CU	一拖三/四外机 System 3/4 CU	4p一拖四/五外机 System 4/5 CU
型号 Model	BWZ50A1R*	BWZ72A1R*	BWZ72A1R*	BWZ100A1R*+BDQ100A*
适用能力 Capacity	18K	24K/28K	28K/30K	36K/42K
工作电压范围 Operating Voltage Range	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	7A	12A	16A	25A
最大输入功率 Max Input Power	1540W	2640W	3520W	5500W
工作温度 Ambient Temp	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
驱动冷却形式 Cooling Mode	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled
通讯方式 Communication Mode	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication	零火线通讯 Current loop communication
输入参数 Input	感温包x7、开关量x2; Temp. Sensor x7, Switch x2	感温包x9、开关量x2; Temp. Sensor x9, Switch x2	感温包x11、开关量x2; Temp. Sensor x11, Switch x2	感温包x13、开关量x4、跳线帽; Temp. Sensor x13, Switch x4, Jumper
控制对象 Object Control	交/直流电机、电子膨胀阀x2、 交流220V负载x4; AC motor/DC motor, EEV x2, AC 220V Load x4	交/直流电机、电子膨胀阀x3、 交流220V负载x4; AC motor/DC motor, EEV x3, AC 220V Load x4	交/直流电机、电子膨胀阀x4、 交流220V负载x4; AC motor/DC motor, EEV x4, AC 220V Load x4	交/直流电机、电子膨胀阀x5、 交流220V负载x4; AC motor/DC motor, EEV x5, AC 220V Load x4
组件 Component	主控板 + PFC电抗器 Mainboard + PFC Reactor	主控板 + PFC电抗器 Mainboard + PFC Reactor	主控板 + PFC电抗器 Mainboard + PFC Reactor	主控板+驱动板+PFC电感 Mainboard + Driver Board + PFC Inductor

小型VRF空调控制器 Mini-VRF AC Controls

特点 / Features



自主知识产权的控制算法
Control algorithm of independent intellectual property rights



无极性通讯技术
Non-polar communication technology



内外机自动寻址技术
Internal and external machine automatic addressing technology



高频PFC 功率因数>0.99
High efficiency PFC, power factor>0.99



补气增焓
双级压缩控制技术
Enriched enthalpy / two-stage compression control technology



双电子膨胀阀
控制技术
Dual electronic expansion valve control technology



双重过冷技术
Dual supercooling technology



三重油分离技术
Triple oil separation technology



多重油控制技术
Multiple oil control technology



油平衡技术
Oil balancing technology



制热不换向回油技术
Heating without reversing oil return technology



冷媒平衡技术
Refrigerant balance technology



快速智能匹配压缩机
Fast and intelligent matching compressor



云智能控制技术
Cloud intelligent remote control technology



全方位保护功能
Full protection



自诊断功能
Self-diagnostic function



工作温度范围-30 ~ 60°C
Operating temperature range: -30 ~ 60 °C



宽工作电压范围
Wide voltage range
165V - 265V (50/60Hz)

功能点 / Functions



超静音功能
Quiet function



故障智能检测
Intelligent fault detection



高精度压力传感器
High-Precision pressure sensor



快速制冷制热
Fast heating/cooling



低温除湿
Low temperature dehumidification



掉电记忆
Power-off memory



智能化霜
Intelligent defrost

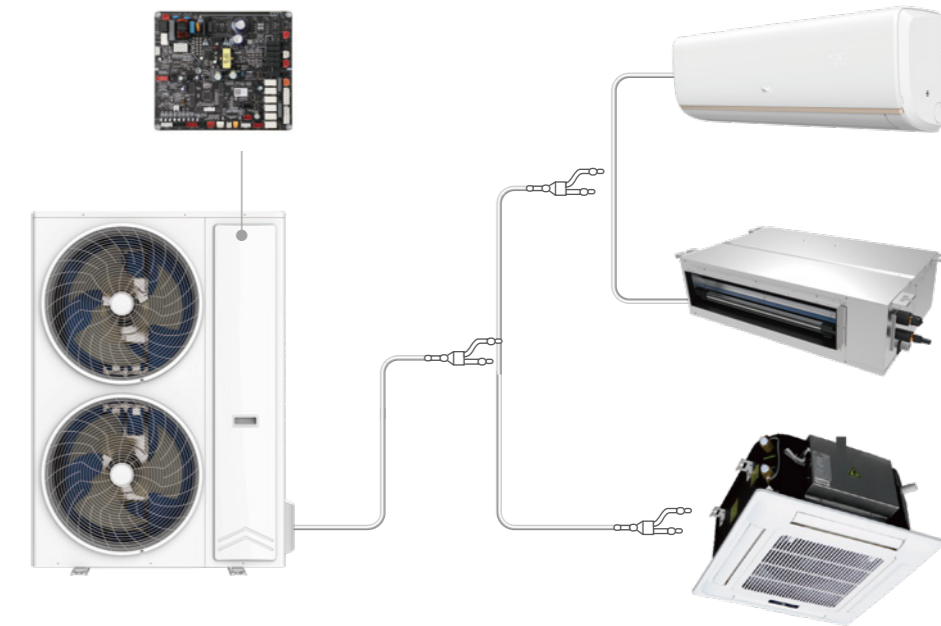


-30°C超低温制热
-30°C low temperature heating (optional)



16重安全保护
16 Safety protection

解决方案 / Solution



参数规格 / Parameter

产品类型 Category	4HP	6HP	8HP
型号 Model	BW175B*+BDQ100A*	BW175B*+BDQ175A*	BW175B*+BSQ180B*
适用能力 Capacity	10kW	16kW	22.4kW
工作电压范围 Operating Voltage Range	220VAC ± 20%	220VAC ± 20%	380VAC ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	25A	34A	18A
最大输入功率 Max Input Power	5500W	7500W	10500W
工作温度 Ambient Temp	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
通讯方式 Communication Mode	RS-485	RS-485	RS-485
驱动冷却形式 Cooling Mode	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled
输入参数 Input	感温包x9, 压力传感器x2, 开关量x3, 2位拨码、跳线帽、Wi-Fi /GPRS Temp. Sensor x9, Pressure sensor x2, Switch x3, 2 Digit dial code, Jumper, Wi-Fi /GPRS	感温包x9, 压力传感器x2, 开关量x3, 2位拨码、跳线帽、Wi-Fi /GPRS Temp. Sensor x9, Pressure sensor x2, Switch x3, 2 Digit dial code, Jumper, Wi-Fi /GPRS	感温包x9, 压力传感器x2, 开关量x3, 2位拨码、跳线帽、Wi-Fi /GPRS Temp. Sensor x9, Pressure sensor x2, Switch x3, 2 Digit dial code, Jumper, Wi-Fi /GPRS
控制输出 Control Output	交/直流风机, 电子膨胀阀x2, 交流220V负载x7 AC/DC motor x2, EEV x2, AC 220V Load x7	交/直流风机x2, 电子膨胀阀x2, 交流220V负载x7 AC/DC motor x2, EEV x2, AC 220V Load x7	交/直流风机x2, 电子膨胀阀x2, 交流220V负载x7 AC/DC motor x2, EEV x2, AC 220V Load x7
组件 Component	主控板+驱动板+滤波板+PFC电感 Mainboard + Driver Board + EMI Board + PFC Inductor	主控板+驱动板+滤波板+PFC电感 Mainboard + Driver Board + EMI Board + PFC Inductor	主控板+驱动板+滤波板+PFC电感 Mainboard + Driver Board + EMI Board + PFC Inductor

04

ADENTECH

热泵产品控制解决方案

DRIVE & CONTROL SOLUTION FOR HEAT PUMP

AdenTech的热泵控制方案采用精准的直流变频技术，全面调控压缩机、风机、电子膨胀阀等核心部件。我们的方案能够在-30°C至60°C的广泛温度范围内提供精准的温控，并通过智能调节提升能效，简化安装调试，进一步优化用户体验，带来更加舒适、平稳的使用感受。

ADENTECH's heat pump control solutions utilizes precise DC inverter technology to efficiently manage key components. The system operates reliably across a wide temperature range from -30°C to 60°C, while also optimizing energy efficiency, simplifying installation and enhancing the overall user experience, providing comfort and stable in all conditions.



产品系列 / Product Series

- 采暖机控制器
Air Source Heat Pump Controls
- 热水机控制器
Water Heater Heat Pump Controls
- 欧洲热泵控制器
European Heat Pump Controls

特点 / Features



自主知识产权的控制算法
Patented control algorithms



高频PFC 功率因数>0.99
High efficiency PFC, power factor>0.99



多电子膨胀阀
流量分配技术
Dual electronic expansion valve control technology



补气增焓
双级压缩控制技术
Enriched enthalpy / two-stage compression control technology



双电子膨胀阀控制技术
Dual electronic expansion valve control



多重油控制技术
Multiple oil control technology



低频平顺运行
Low frequency smooth running



超宽频精准运行
Ultra-wide frequency accurate running



全方位保护功能
Full protection



工作温度范围
Operating temperature range: -30 ~ 60 °C



宽工作电压范围
Wide voltage range
165V - 265V (50/60Hz)

功能点 / Functions



超静音功能
Quiet function



地板干燥功能
Floor drying function



超低温制热 -30°C
low temperature heating (optional)



高出水温度
High outlet water temp



高精度压力传感器
High-precision pressure sensor



防冻结功能
Anti-freeze function



快速制冷制热
Fast heating /cooling



智能化霜
Intelligent defrost



自诊断功能
Self-diagnostic function

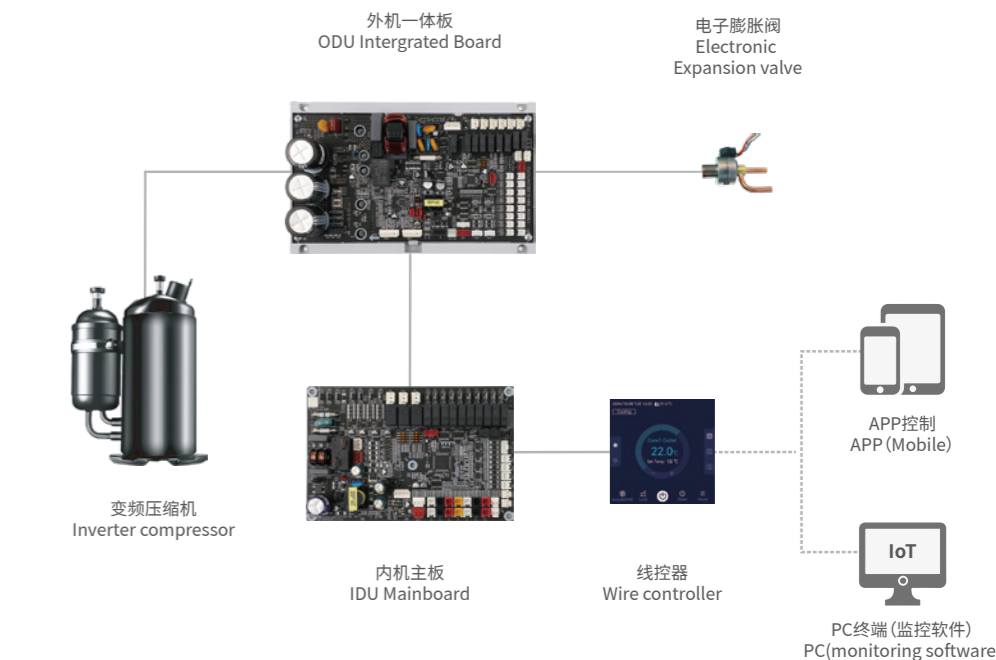


掉电记忆
Power-off memory



智能Wi-Fi
Smart Wi-Fi (optional)

解决方案 / Solution



参数规格 / Parameter

产品类型 Category	4kW~8kW 220~240V-1Ph	8kW~12kW 220~240V-1Ph	12kW~16kW 220~240V-1Ph	12kW~16kW 380~415V-3Ph
	一体板 Integrated Board	一体板 Integrated Board	外机板+驱动 Outdoor Unit Board +Driver Board	外机板+驱动 Outdoor Unit Board+Driver Board
型号 Model	BW100C*/BW72C*	BW175C*	BWPA1N1+BDQ170C*	BWPA1N1+BSQ180F*
工作电压范围 Operating Voltage Range	220VAC±20%	220VAC±20%	220VAC±20%	380VAC±20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	18A	23A	30A	12A
最大输入功率 Max Input Power	4000W	5000W	6500W	7000W
工作温度 Ambient Temp	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C	-30 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
通讯方式 Communication Mode	RS-485*3	RS-485*3	RS-485*3	RS-485*3
驱动冷却形式 Cooling Mode	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled	风冷 Air-cooled
输入参数 Input	感温包x20、压力传感器x3、开关量x10、4位拨码x2 Temp. Sensor x20、Pressure Sensor x3、On-Off Switch x10、Dial Switch x2			
控制对象 Object Control	直流电机x2、电子膨胀阀x2、交流220V负载x20 DC motor x2、EEV x2、AC220V Load x20			
组件 Component	内机板 + 一体板 (集成主板、驱动板、滤波板为一体板) + 电抗器 Indoor Unit Board + Integrated Board (Control & Drive Board, Filter Board) + Reactor		内机板 + 外机板 + 驱动板 (集成滤波) + 电抗器 Indoor Unit Board+Outdoor Unit Board + Driver Board (Intergrated Filter Board) + Reactor	
产品类型 Category	内机板 Indoor Unit Board			
型号 Model	BNPB2N1			
控制对象 Object Controller	三通阀 (混水)、生活水箱电加热、外置辅助电加热*2、混水泵、外置水泵、太阳能水泵、生活热水回水泵、二通阀、三通阀 (生活热水)、温控器 (低电压)、温控器 (高电压)、智能电网、太阳能模块输入信号、外部热源 (干触点) 3-way Valve (Mixed Water), Tank Electric Heater, External Auxiliary Electric Heater*2, Mixing Water Pump, External Water Pump, Solar Water Pump, DHW Return Water Pump, 2-way Valve, 3-way Valve, Thermostat (Low Voltage), Thermostat (High Voltage), Smart Grid, Solar Kit Input Signal, Auxiliary Heat Source (Dry Contact)			

05

ADENTECH

整体式HVAC产品控制解决方案

INTEGRATED HVAC PRODUCT CONTROL SOLUTION

亚丁科技不仅为传统HVAC产品提供电控方案，还根据客户需求提供定制化解决方案，包括除湿、新风、先进热回收等多种制冷、制热系统等。

亚丁科技的一站式产品设计服务，涵盖结构和电控设计、系统方案及物联网解决方案。

作为技术驱动型公司，亚丁科技始终致力于为用户提供领先的智能控制解决方案。

ADENTECH provides integrated electrical control solutions for traditional HVAC products, along with customized solutions tailored to customer needs, including dehumidification, fresh air systems, advanced heat recovery, and a range of cooling and heating systems.

In addition, ADENTECH offers comprehensive product design services, including structural design, system solutions, electrical control design and IoT integration.

As a technology-driven company, ADENTECH is committed to providing leading-edge smart control solutions for customers.



产品系列 / Product Series

- 除湿机控制器
Dehumidifier Controls
- 移动机控制器
Portable AC Controls
- 新风机控制器
Air Purifier Controls

特点 / Features



自主知识产权的控制算法
Patented control algorithms



高频PFC 功率因数>0.99
High efficiency PFC, power factor>0.99



全方位保护功能
Full protection



低频平顺运行
Low frequency smooth running



超宽频精准运行
Ultra-wide frequency accurate running



云智能控制技术
Cloud intelligent remote control technology



宽工作电压范围
Wide voltage range
165V - 265V (50/60Hz)

功能点 / Functions



低功耗待机0.5w
Low power standby



掉电记忆
Power-off memory



快速除湿
Rapid dehumidification



自动化霜
Intelligent defrost



智能Wi-Fi
Smart Wi-Fi (optional)



24小时定时功能
24 hour timing function



冷等离子
Cold plasma (optional)



智能换新风
Smart fresh air system



电子控制
Electronic control



自诊断功能
Self-diagnostic function

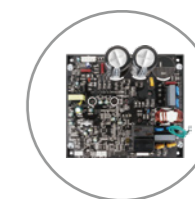


自动停机
Automatic stop



水满提示
Water full alert

解决方案 / Solution



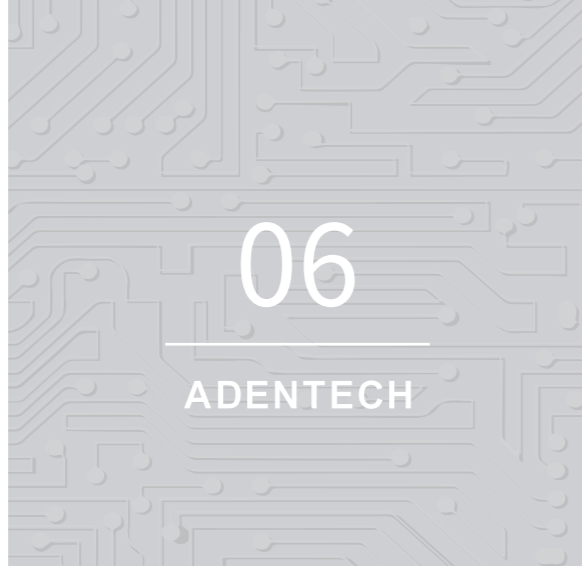
除湿机驱动板
dehumidifier driver board



除湿机主板
dehumidifier control mainboard

参数规格 / Parameter

产品类型 Category	家用定频除湿机 Residential Fixed Speed Dehumidifier	家用变频除湿机 Residential Inverter Dehumidifier	中央变频除湿机 Commerical Dehumidifier Inverter Type
型号 Model	DNH*	BNH*	BW35B*
适用能力 Capacity	10 ~ 30L	10 ~ 50L	30 ~ 100L
工作电压范围 Operating Voltage Range	220VAC ± 20%	220VAC ± 20%	220VAC ± 20%
频率 Frequency	50/60Hz	50/60Hz	50/60Hz
最大输入电流 Max Input Current	5A	8A	15A
最大输入功率 Max Input Power	1100W	1760W	3300W
工作温度 Ambient Temp	0 ~ 60°C	0 ~ 60°C	0 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C
通讯方式 Communication Mode	/	UART	RS-485
驱动冷却形式 Cooling Mode	/	风冷 Air-cooled	风冷 Air-cooled
输入参数 Input	温湿度传感器、感温包、水位开关 Temperature And Humidity Sensor, Temperature Package, Water Level Switch	温湿度传感器、感温包、水位开关 Temperature And Humidity Sensor, Temperature Package, Water Level Switch	温湿度传感器、感温包、水位开关 Temperature And Humidity Sensor, Temperature Package, Water Level Switch
控制输出 Output	定频压缩机、pg电机、扫风电机 Fixed Speed Compressor, Pg Motor, Sweep Motor	变频压缩机、pg电机、扫风电机 Inverter Compressor, Pg Motor, Sweep Motor	变频压缩机、直流电机*2、电子膨胀阀、交流负载*3 Inverter Compressor, DC Fan Motor*2, EEV, AC Load*3
组件 Component	显示板+主板+温湿度传感器 Display Board + Main Board + Temperature And Humidity Sensor	显示板+主板+温湿度传感器 Display Board + Main Board + Temperature And Humidity Sensor	线控器+主板+温湿度传感器 Wired Controller + Main Board + Temperature And Humidity Sensor



IoT智能控制方案

IOT SMART CONTROL SOLUTION

亚丁科技的IoT智能控制方案覆盖智能家居、工商业和开放性场所，打造全场景智慧物联网体验。

通过专属Wi-Fi模块、NB、4G/5G无线控制方案，用户可便捷管理各类智能设备，享受无缝连接带来的操作体验。

我们的独立APP支持多种家电产品的集中控制，并结合私有云服务确保数据安全，提供个性化的智能管理方式。亚丁将物联网与人工智能技术深度融合，为用户带来更便捷、更智能的生活方式，充分展现技术驱动的创新实力。

ADENTECH' s IoT solutions for smart homes, commercial spaces, and industrial settings, providing seamless connectivity and intuitive control.

With Wi-Fi, NB, and 4G/5G options, users can easily manage devices for maximum convenience.

Our app supports centralized control of multiple household appliances and combines private cloud services to ensure data security.

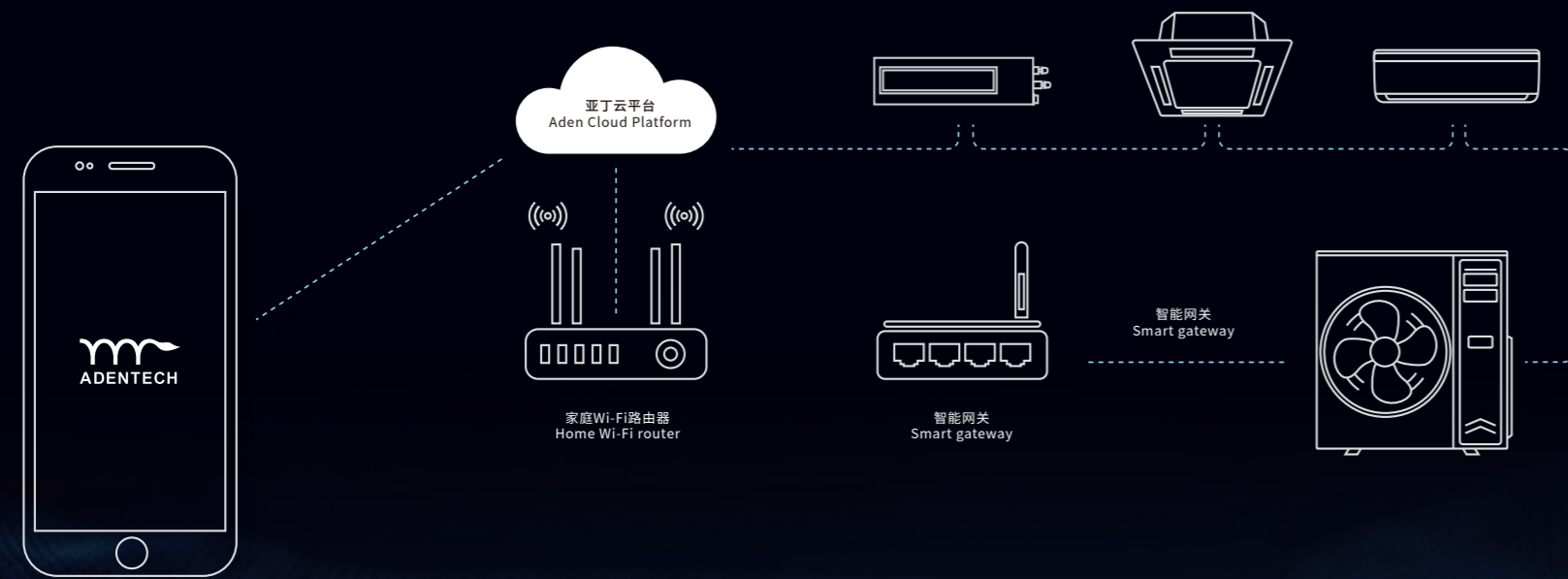
Provide personalized intelligent management. AdenTech integrates the IoT and AI technology, bringing users a more convenient and intelligent lifestyle.

Demonstrating the technology driven strength of AdenTech.



智能物联网平台 / Product Series

- IoT智能控制
IoT intelligent controls
- 远程运控
Remote operation and controls



亚丁 Aden App

功能点 / Functions

接入方式 / Access method

- Wi-Fi/蓝牙模组
Wi-Fi / Bluetooth module
- 2G/4G/5G、GPRS模组
2G/4G/5G, GPRS module
- NB-IoT模组
NB-IoT module

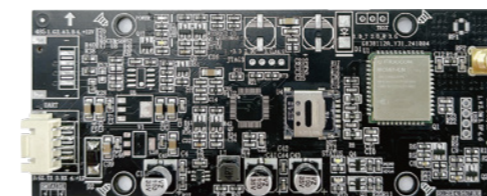
云服务平台搭建 / Cloud platform

- 基于小米等平台，提供接入服务
Provide access services based on platforms such as Xiaomi
- 基于阿里云，亚马逊，提供云接入服务
Provide cloud access services based on Alibaba Cloud and Amazon
- 独立的服务器部署服务
Independent server deployment services

APP

- 小米平台插件开发服务
Xiaomi platform plugins development services
- 阿里云、亚马逊云、自有云等自有App开发服务
Alibaba Cloud, Amazon Cloud, Own Cloud and other own app development services

参数规格 / Parameter



亚丁4G模组
ADEN 4G MODULE

产品类型 Category	Wi-Fi单模模组 Wi-Fi single-mode Module	Wi-Fi+BLE双模模组 Wi-Fi+BLE dual-mode Module
型号 Model	YDNWF*	YDNWFB*
工作电压 Operating Voltage	5V/3.3V	5V/3.3V
通讯方式 Communication Mode	UART	UART
天线类型 Antenna Type	板载天线/外接天线 On-board antenna / External antenna	板载天线/外接天线 On-board antenna / External antenna
组件 Component	Wi-Fi 模块+Wi-Fi 盒子 Wi-Fi Module + Wi-Fi Box	Wi-Fi 模块+Wi-Fi 盒子 Wi-Fi Module + Wi-Fi Box
工作温度 Ambient Temp	0 ~ 60°C	0 ~ 60°C
储存温度 Storage Temp	-40 ~ 85°C	-40 ~ 85°C