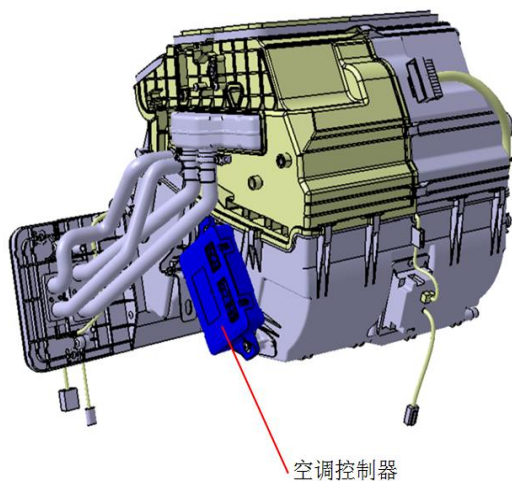


4、 Air conditioning controller 空调控制器

◆Assembly Introduction 装配介绍

The air conditioning controller is mounted on the left side of the air conditioning box body assembly, near the driver's right leg side, and is secured by 2 screws. 空调控制器安装在空调箱本体总成的左侧，靠近驾驶员右腿侧，由2颗螺钉固定。



空调控制器

Air conditioning controller



多媒体显示屏

Multimedia display

◆Function Introduction 功能简介

The air conditioning system of the X5000 model is an integrated cooling and heating automatic air conditioning, with optional parking air conditioning and fresh air system. The air conditioning controller controls the operation of the entire air conditioning system, and the control interface of the system is on the dashboard multimedia display. X5000车型空调系统为冷暖一体式自动空调，可选配驻车空调、新风系统。空调控制器控制整个空调系统的运行情况，系统的操控界面在仪表台多媒体显示屏上。

4、Air conditioning controller 空调控制器

◆Function 功能简介

- In addition to the power-on alarm interface, when adjusting the air conditioner through the physical button in any interface, the corresponding adjustment interface pop-up window will be displayed and disappear automatically after 3s (no such pop-up window when parking air conditioner is optional).
- 除开机告警界面，在任意界面通过实体按键调节空调时，显示对应调节界面弹窗，3s后自动消失（选配驻车空调时无此弹窗）。
- Temperature adjustment range value 16 °C ~ 32 °C, up / down sliding settings; maximum wind speed of 8-speed wind, fan icon half fan blade indicates 1 gear, up / down sliding settings; air conditioning wind mode has 5 kinds: blowing face → blowing face blowing feet → blowing feet → blowing feet defrost → defrost.
- 温度调节范围值16°C ~ 32°C，向上/向下滑动设置；最高风速为8档风，风扇图标半个扇叶表示1档，向上/向下滑动设置；空调出风模式有5种：吹脸→吹脸吹脚→吹脚→吹脚除霜→除霜。
- The air conditioner controller directly drives the heating and cooling damper motor, mode damper motor, water valve motor, defrost damper motor, inside and outside circulation motor and compressor. The air conditioning controller collects signals from the evaporator temperature sensor, cab outdoor temperature sensor, cab indoor temperature sensor, and sunlight sensor, and sends the temperature values of the cab indoor/outdoor temperature sensor and evaporator temperature sensor to the CAN bus in the form of telegrams.
- 空调控制器直接驱动冷暖风门电机、模式风门电机、水阀电机、除霜风门电机、内外循环电机以及压缩机工作。空调控制器采集蒸发器温度传感器、驾驶室室外温度传感器、驾驶室室内温度传感器、阳光传感器的信号，并将驾驶室室内/外温度传感器、蒸发器温度传感器的温度值以报文形式发送到CAN总线上。

4、 Air conditioning controller 空调控制器

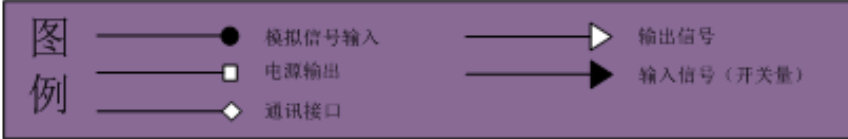
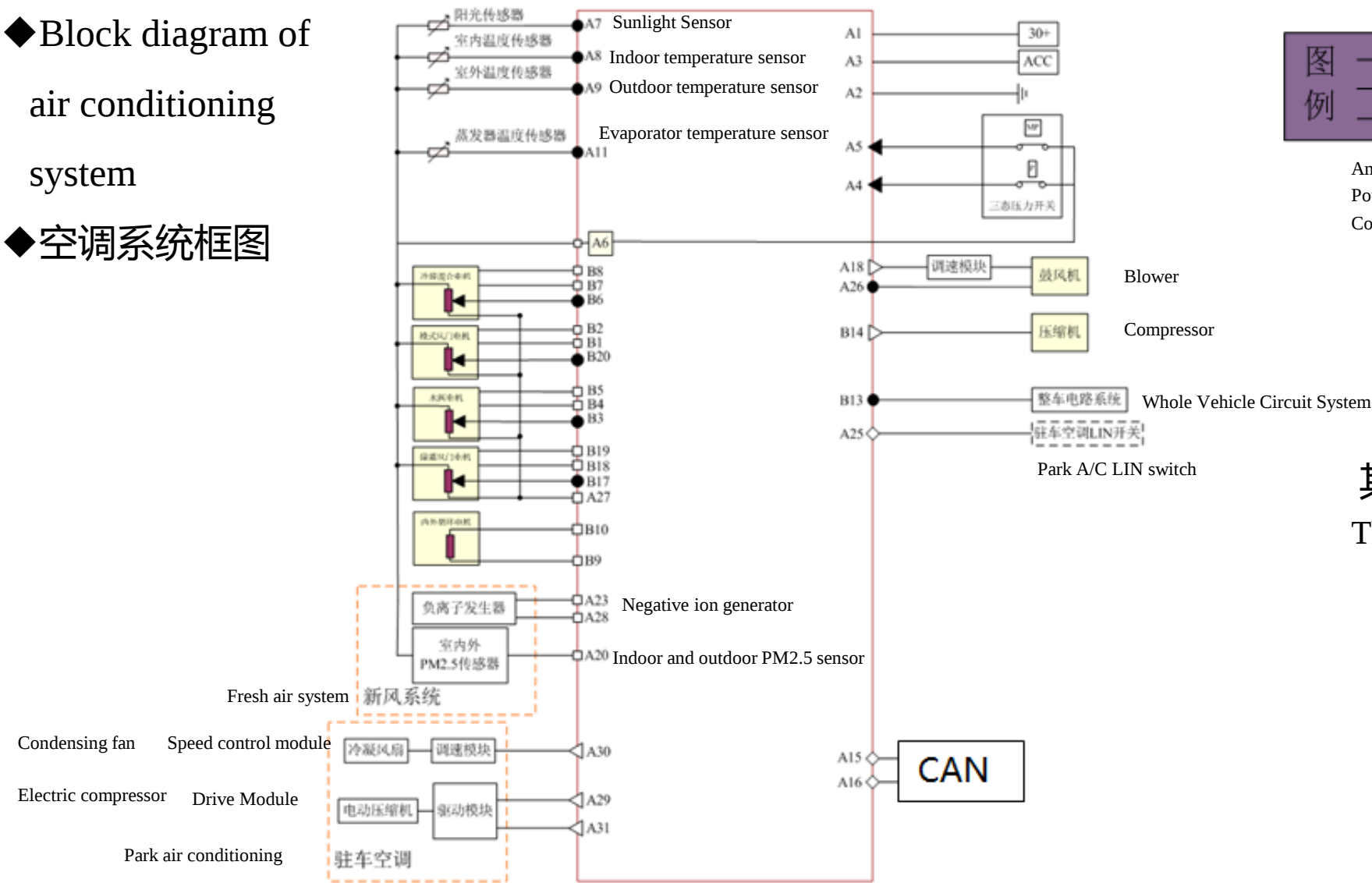
◆Function 功能简介

- The air conditioning system can be equipped with optional park air conditioning. The air conditioning controller controls the start and stop of the park air conditioning compressor and condensing fan as well as the speed.
- 空调系统可选配驻车空调，空调控制器控制驻车空调压缩机、冷凝风扇的启停以及转速。
- The air conditioning system can be equipped with a fresh air system. The controller provides power for the negative ion generator and PM2.5 sensor, and the PM2.5 sensor sends the monitored indoor and outdoor PM2.5 values of the cab to the air conditioning controller in the form of CAN messages, and the air conditioning controller controls the on/off of the negative ion generator according to the PM2.5 values.
- 空调系统可选配新风系统，控制器为负离子发生器、PM2.5传感器提供电源，PM2.5传感器将监测到的驾驶室室内外PM2.5值通过CAN报文的形式发送给空调控制器，空调控制器根据PM2.5值控制负离子发生器的开启/关闭。

4、 Air conditioning controller 空调控制器

◆Block diagram of
air conditioning
system

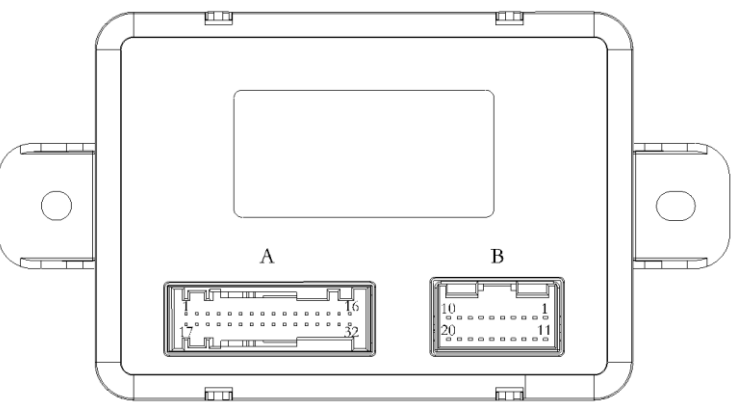
◆空调系统框图



其中，虚线框中为选配功能。
The dashed boxes are optional features

4、 Air conditioning controller 空调控制器

◆ Definition 针脚定义

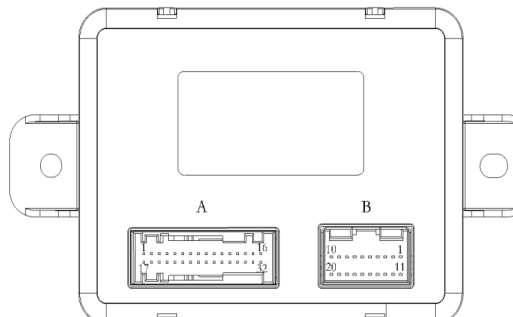


插接器	针脚	定义	备注
插接器 A 部 AMP: 967598 -1	1	30+	16V~32V
	2	GND	
	3	ACC	24V
	4	中压信号	
	5	高压/低压信号	
	6	信号地	各传感器地
	7	阳光传感器+	
	8	室内温度传感器+	
	9	室外温度传感器+	
	10	NC	
	11	蒸发器温度传感器+	
	12	NC	
	13	NC	
	14	NC	
	15	CAN_H	
	16	CAN_L	
	17	NC	
	18	鼓风机调速模块控制信号	
	19	NC	
	20	粉尘传感器电源+12V	PM2.5 传感器
	21	NC	
	22	NC	
	23	负离子发生器+12V	
	24	NC	
	25	LIN	卧辅处驻车空调开关
	26	鼓风机反馈	
	27	+5V 电源	
	28	负离子发生器 GND	
	29	电动压缩机调速信号	
	30	冷凝风扇调速信号	PWM 信号, 幅值 12V
	31	驻车电动压缩机使能信号	低有效
	32	NC	

插接器	针脚	定义	备注
插接器 B 部 AMP: 174977-2	1	模式电机 (-)	
	2	模式电机 (+)	
	3	水阀电机反馈	
	4	水阀电机 (-)	
	5	水阀电机 (+)	
	6	冷暖电机反馈	
	7	冷暖电机 (-)	
	8	冷暖电机 (+)	
	9	内外循环-	
	10	内外循环+	
	11	NC	
	12	NC	
	13	空调识别信号 1	高为双模空调 (带驻车空调配置), 其余情况常规空调
	14	压缩机离合信号	
	15	鼓风机继电器控制信号	
	16	NC	
	17	除霜电机反馈	
	18	除霜电机 (-)	
	19	除霜电机 (+)	
	20	模式电机反馈信号	

4、 Air conditioning controller 空调控制器

◆ Definition 针脚定义

Pluggger	Pins	Definition	Remarks	Pluggger	Pins	Definition	Remarks
	1	30+	16V-32V	Pluggger Part B AMP: 174977-2	1	Mode Motor (-)	16V-32V
	2	GND			2	Mode Motor (+)	
	3	ACC	24V		3	Water valve motor feedback	24V
	4	Medium Voltage Signal			4	Water Valve Motor (-)	
	5	High Voltage/Low Voltage Signals			5	Water Valve Motor (+)	
	6	Signal Ground	Each sensor ground		6	Heating and cooling motor feedback	Each sensor ground
	7	Sunlight sensor			7	Heating and cooling motor (-)	
	8	Indoor temperature sensor			8	Heating and cooling motor (+)	
	9	Outdoor temperature sensor			9	Internal and external circulation (-)	
	10	NC			10	Internal and external circulation (+)	
	11	Evaporator temperature sensor			11	NC	
	12	NC			12	NC	
	13	NC			13	Air conditioning recognition signal 1	High for dual mode air conditioning (with park air conditioning configuration), the rest of the case conventional air conditioning
	14	NC			14	Compressor clutch signal	
	15	CAN_H			15	Blower relay control signal	
	16	CAN_L			16	NC	
	17	NC			17	Defrost motor feedback	
	18	Blower speed control module control signal			18	Defrost motor (-)	
	19	NC			19	Defrost motor (+)	
	20	Dust sensor power supply	PM2.5 sensor		20	Mode motor feedback signal	PM2.5 sensor
	21	NC					
	22	NC					
	23	Negative ion generator					
	24	NC					
	25	LIN	Park air conditioner switch at sleeper				
	26	Blower feedback					
	27	+5V Power supply					
	28	Negative ion generator					
	29	Electric compressor speed control signal					
	30	Condensing fan speed signal	PWM Signal Amplitude 12V				
	31	Parking electric compressor enable signal	Low effective				
	32	NC					

Plug-in connector part A AMP : 967598-1

4、 Air conditioning controller空调控制器

◆Repair Case 故障维修案例

Fault reported on combination meter: **SPN 521150, FMI 21 - blocked heating and cooling motor**

组合仪表上报故障: **SPN 521150, FMI 21——冷暖电机堵转**

Verification steps :

排查步骤:

Step1: Use diagnostic instrument to check whether the controller software version V1.0.4 and above, if not, please upgrade the controller program to the latest version of the state, re-check the cooling and heating motor function, if the fault is lifted for the reasons of the low version of the controller software, if the fault still exists, please carry out step 2, if the software update fails, please directly carry out step 4.

Step1: 诊断仪查看控制器软件版本是否V1.0.4及以上版本, 若不是, 请升级控制器程序至最新版本状态, 再次检查冷暖电机功能, 若故障解除则为控制器软件版本低的原因, 若故障依然存在请进行第2步, 若软件更新失败请直接进行第4步;

4、 Air conditioning controller空调控制器

Step2: Keep the air conditioning system normally connected, turn on the air conditioning, adjust the set temperature from the highest to the lowest or from the lowest to the highest, use a multimeter to measure the voltage value of pin B6 of the air conditioning controller (heating and cooling motor feedback): if the voltage value remains unchanged, please proceed to step 3; if the voltage value rises or falls normally between 0.05V and 4.95V, the motor works normally, please proceed to step 4;

Step2: 保持空调系统正常连接状态，开启空调，调节设定温度从最高到最低或者从最低到最高，用万用表测量空调控制器B6针脚（冷暖电机反馈）电压值：若电压值保持不变，请进行第3步；若电压值在0.05V ~ 4.95V之间正常升高或降低，则电机工作正常，请进行第4步；.

Step3: Please repair or replace the heating and cooling motor, if the fault is lifted then the motor is faulty, if the fault still exists please proceed to step 4.

Step3: 请维修或更换冷暖电机，若故障解除则为电机故障，若故障依然存在请进行第4步；

Step4: Replace the air conditioning controller.

Step4: 更换空调控制器。

4、Air conditioning controller 空调控制器

◆Disassembly instructions 拆卸说明

Step1: Removal of multimedia display, combination instrument cover assembly, small storage box, middle panel body.

拆卸多媒体显示屏、组合仪表罩总成、小储物盒、中间面板本体；

Step2: Unplugging of the air conditioning controller harness. 拔掉空调控制器线束；

Step3: Unscrew bolts 1 and 2 and remove the air conditioner controller as shown in the figure below.

拧出螺栓1、2，拆下空调控制器，如下图所示。

