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车用空调器系统 使用安装说明书

*本说明书适用于山东康堡分体机械式车载空调器系统

KB系列空调系列　适用于拖拉机、收获机、工程机械、等车辆，由于各为主机厂提供的方案不近相同，外观请以实物为准。

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安全注意事项:(使用前需先阅读)

尊敬的康堡用户欢迎使用康堡空调,为更好的方便阅读本说明书,我们将出现的标志解释如下:

凡带有该“警示”标志的内容,有关产品安全或使用者的人身安全,必须严格按照警示内容操作作,否则可能引起产品功能故障,或者对使用者造成潜在的危害。

凡带有该“禁止”标志的内容,是绝对禁止的行为,否则可能引起产品损坏,或者危及使用者人身安全。

■ 禁止将与适配车型电压不符的产品安装在一起,安装前选择产品时务必检查,务必选择与所配车型电压相符的产品,安装时注意对接线束的正负极性,切勿接反,否则可能导致空调器不能够工作,或者烧坏产品,甚至引起火灾危及安全。

■ 切勿触及空调器工作中的风机叶片、压缩机、高压空调管路、冷凝器表面,否则会危及安全导致受伤。

■ 加注冷媒时切勿让冷媒触身体裸露皮肤,否则可能用引起冻伤。

■ 安装产品时严格按照技术设计工艺安装,否则可能导致产品不能够正常工作或达不到产品设计的性能。

■ 使用时必须保持冷凝器保持冷凝器散热性能良好,否则或引起系统功能性故障或产品性能下降。

■ 选择、更换空调保险丝时,应选择合适容量的保险片,否则会引起保险经常熔断或不能工作 。或者保护失效导致烧坏设备.

■ 不要长时间在密闭的空间内使用空调器,否则存在危险。

1.产品组成与工作原理

■ 1.1工作原理:

SDKB K系列分体机械式空调器系统由制冷系统、制热系统、和控制系统组成。

■ 1.2 制冷系统组成与工作原理:

制冷系统是由压缩机、冷凝器、膨胀阀、蒸发器、贮液干燥器、空调管路组成 。启动汽车空调系统后,压缩机在发动机带动下开始工作,驱动环保型制冷剂R134a,在密封的空调系统中循环流动,利用其汽化过程吸收周围空气中热量的原理,达到降低驾驶室内的空气温度。

空调器的基本工作原理,高压气态制冷剂由压缩机出口进入冷凝器时,被穿过冷凝器的空气将热量带走,冷却后形成高压液态制冷剂,在储液干燥器中滤去水分杂质,进入热力膨胀阀节流形成低压液态制冷剂,进入蒸发器后,通过吸收蒸发器周围空气的热量而蒸发成低压气态制冷剂,再次进入压缩机,如此不断循环,将驾驶室内的空气热量转移至驾驶室外空气中,以达到降温目的。

■1.3 制热系统组成与工作原理:

水冷式发动机的高温水(或冷却液)经过手动阀门(或电控阀门) 分流一部分通过暖风水管流入空调暖风芯体,车内冷空气被鼓风电机吸入强迫通过暖风芯体后,空气被加热给车内供暖。

■ 1.4 控制系统组成与工作原理:

1.4.1 该型空调鼓风机设置了三档风机转速,由控制面板控制。

1.4.2 为保证系统能够正常工作,系统采用压力开关控制高、低压压力保护。

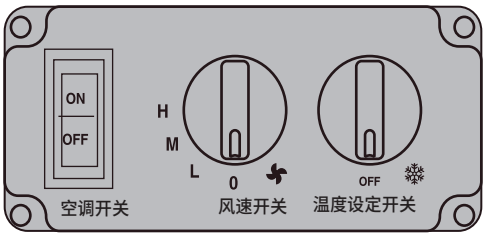
1.4.3 制冷温度又控制面板上的温度设定开关控制。

1.4.4 制冷系统的总开关由控制面板上的AC翘板开关控制。

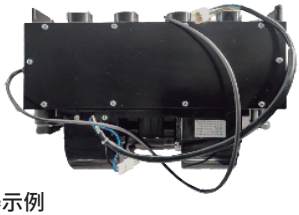
1.4.5 制冷系统和制热系统相对独立,可依据需求单选用。有的机型只有制冷系统或制热系统。

■ 常见机械式通用空调控制面板说明示意:

控制面板包括,AC空调开关、风速开关、温度设定开关,组成。AC空调开关在制冷模式下使用,打开即空调制冷模块上电参与工作。风速开关是控制蒸发器鼓风电机的转速来调节蒸发器的送风量。温度设定开关旋钮,来设定温度高低的,旋转温度设定旋钮可以设定制冷模式需要的温度。



蒸发器示例



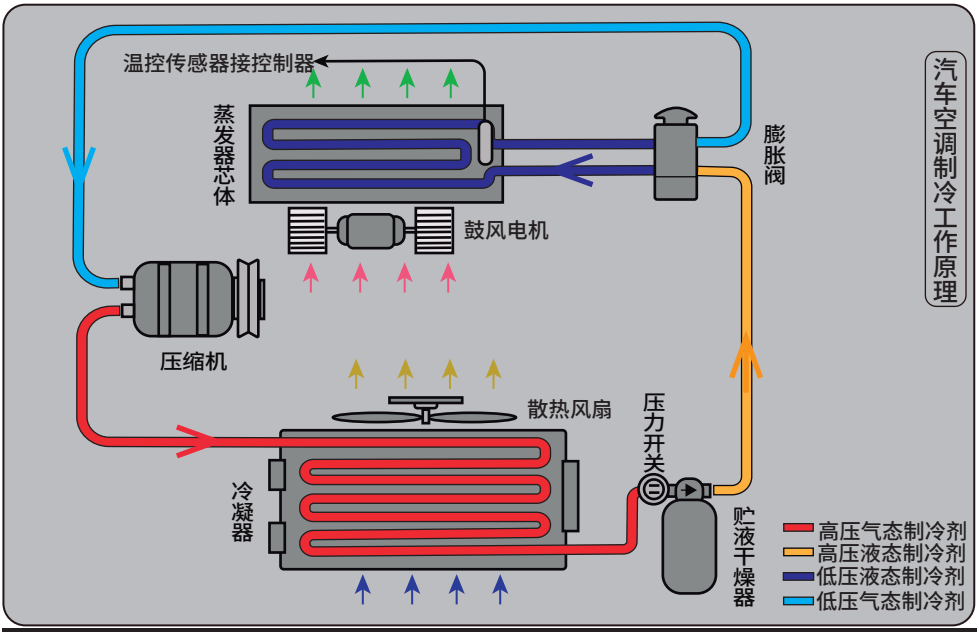
冷凝器示例

冷凝器示例

压缩机示例

控制面板

注意：由于不同客户产品结构不同，配置的空调系统的蒸发器和冷凝器外观也不近相同，实际以实物为准。



2.安装注意事项

■2.安装时注意事项：

■2.1 压缩机的安装：压缩机安装时应选择合适的支架固定，压缩机支架需有足够的刚性和强度，压缩机皮带需方便调整装卸，张紧度松紧适度。压缩机液口向上，倾斜度在+15度以内，否则压缩机冷冻油容易带出，导致润滑不良容易损坏压缩机。

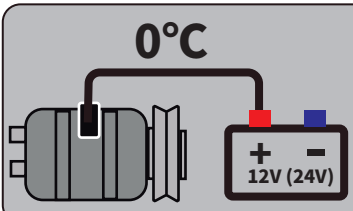
■2.2 安装蒸发器时应注意保证排水管排水顺畅，否则容易蒸发器积水，导致积水从蒸发器出风口喷出，影响使用体验度。

■2.3 线束和管路应远离发动机排气管等高温部位，否则可能会烫坏设备。

■2.4 管路安装时应注意保持清洁，避免管道内部开放暴露在空气中，避免杂物、水分等进入管道。否则可能系统不能够正常工作。

■2.5 管路安装时应在各管路接口和O型密封胶圈上涂抹适量冷冻油，小心对接，防止O型密封圈错位和损伤导致系统漏气。

■2.6 拧紧或松开空调管路接头时，务必用俩个扳手，使用合适的扭力，否则可能会导致螺丝螺纹损坏。
■2.7 安装冷凝器时应注意支架合适，切勿使芯体受外力磕碰、拉扯受力，否则会使冷凝器受力变形或破裂。注意安装位置应散热条件良好，在条件允许下尽量优化其散热条件。
■2.8 线束各部位插头必须插接正确牢固，否则可能会因接触不良，导致控制系统失控。



■2.9 在气温较低的北方地区整机出厂冬天需要加注冷媒时，由于环境温度低于传感器触发工作的温度值，导致低温保护，压缩机不能够通电工作，导致加注困难，可以将压缩机电源线从线束上拔下，直接从蓄电池正极给压缩机加上工作电压，促使其电磁离合器吸合工作。如果是冷暖一体的空调机型可以开动发动机打开暖风制暖，待驾驶室温度升高后，压缩机就能够正常吸合了。

3.使用注意事项

■ 如果您的机器配置的是冷暖一体且冷暖转换为手动方式的空调系统时，使用制冷模式时，务必手动将暖风水阀关闭，切断暖风系统的循环热水的流动，否则会导致冷风体验失效。暖风水阀一般在暖风水管进水口连接发动机一端。(不同车厂、车型、位置可能不尽相同)

■ 空调系统工作每班工作完毕后应清理空调滤芯或当感觉蒸发器出风量明显下降制冷效果下降时，应及时清理或更换空调进风处空调滤芯。防止空调滤芯被灰尘堵塞，以免由于空调蒸发器进风量不足，导致损坏空调。

■ 3.1使用操作

3.1.1 启动发动机后才能使用空调，停止发动机时，必须先关空调，后关发动机。

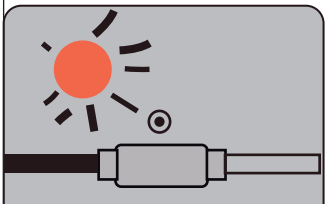
3.1.2 使用冷风时请关闭发动机上暖风水阀。再依次打开风量开关、A/C开关(将其置于ON/开位置)、温控开关(旋转温控开关,温度设置由高到低,此时空调指示灯COOL亮起,如在长期不用冷风 时,温控开关必须旋置于OFF位置,COOL指示灯不亮)。

3.1.3 使用暖风时请确保发动机上暖风水阀处于开启状态!待发动机水温上升后,仅需 打开风量开关就可以出热风,A/C开关必须处于关闭状态。

3.1.4 顶置式蒸发器的空调，机车行驶中，上下坡、急刹车或行驶在颠簸路上时，会有少量蒸发露水喷出均属于正常现象.

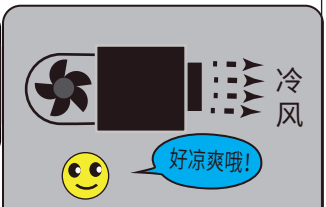
3.1.5正常工作时，当驾驶室温度上升到开机温度时，压缩机离合器吸合，压缩机工作，系统制冷工作。

3.1.6当环境温度低于0°C时,请给发动机水箱加注符合当地气候使用牌号的防冻液！以免冻坏暖风设备！

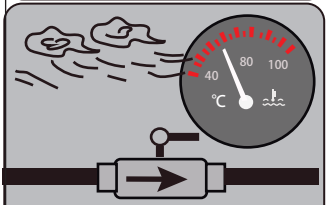


①必须手动关闭发动机上的暖风水阀;(配置有电动水阀的机型忽略此步骤)

②依次打开制冷开关-风量开关.温控开关依据需要您可以选择不同温度.

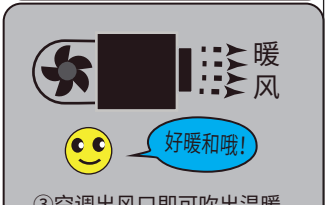


③空调出风口即可吹出凉爽的冷风了.



①必须手动打开发动机上的暖风水阀;(配置有电动水阀的机型忽略此步骤)

②温控选择开关关闭;打开风量开关. 依据需要您可以选择不同风速.



③空调出风口即可吹出温暖的热风了.

4.保养事项

■4.1 定期(建议每班)检查清洗冷凝器,要求散热片内清洁,无堵塞物。
■4.2 定期(建议100小时)检查压缩机的驱动皮带,松紧度松动或老化,如果有上述调整或更换。检查压缩机支架固定螺栓是否有松动现象,如有请及时紧固。
■4.3 在空调器运转一段时间后,应对连接部件、软管等进行检查,是否接头松动,软管是否有损伤老化等。
■4.4 冷凝器、蒸发器风机运转是否灵便。防止异物卡住风机叶片或风机轴承缺油堵转。
■4.5 检查所有的电器接头、电线是否不良,应及时检修和固定。
■4.6 空调系统内的制冷剂会缓慢泄露。正常情况下应每年补充一次,补充量视为泄露量而定。在大量泄漏后加注冷媒前应补充冷冻油适量。

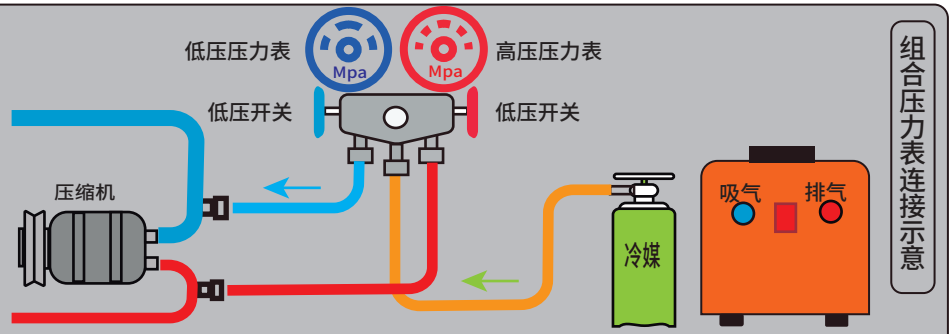
5.常见故障排除

■5.1 空调不制冷
空调制冷模块不制冷,系统任何一个部位不正常工作都会表象为空调不制冷。排除这种原因首先观察压缩机是否正常工作,如果压缩机电磁离合器正常吸合,则考虑系统内冷媒是否存在足够量的冷媒,判断是否存在足够量的冷媒一般需用压力表来测试,一般正常环境温度下低压侧压力在0.1-0.2MP,高压侧在1.0-1.8MP.如果高压压力太低表示冷媒不足或压缩机功能不足,需补充冷媒。冷补不足一般是由于系统存在泄漏点导致的,应检查管路接头等处是否存在漏点,如存在漏点应修复后再重新加注冷媒。
■5.2 空调制冷能力弱
空调制冷能力弱,高压压力高,一般为冷凝器散热能力受限,杂物堵塞,或者冷凝器表面散热能力不足导致的,应提高冷凝器的散热条件,使冷凝器具备足够的散热能力,一般能够解决。如果长时间冷凝器散热不足(杂物灰尘堵塞、冷凝风机失效)会导致压缩机长时间在高压高做功条件下工作,导致压缩机高温拉缸损坏。
■5.3 空调制冷能力弱,蒸发器出风口出风小,空调换气量不足。
一般是由于灰尘堵塞空调系统进风口滤芯导致的,需更换空调滤芯或清理滤芯,使蒸发器进风口通风顺畅。如果灰尘进入蒸发器芯体,需要进一步打开蒸发器,清洗蒸发器芯体。
■5.4 压缩机吸气压力过低,存在负压。压缩机电磁离合器频繁吸合。
一般是由于干燥瓶或膨胀阀被杂质或异物颗粒堵塞,导致压力开关高压保护,清理或更换后一般故障排除。
■5.5 出风口喷水或漏水。
正常情况下,空调蒸发器芯体由于温度低于环境温度,空气中的水分遇冷凝结的水,由于排水管堵塞,或排水不畅导致,蒸发器内积水过多,导致冷凝水从出风口内喷出。安装蒸发器时应保证排水管的水平位置不高于排水孔的位置,使排水顺畅。

5.6 常见空调系统故障排除一览表

现象特征	原因	维修措施
空调不制冷	系统制冷剂不足(缺氟)	检查空调连接处是否有油污渍、沾满灰尘现象,如果有说明此处漏氟。检漏、补充冷媒。
出风口出风不畅	1.通风管路堵塞。 2.蒸发器进风口滤芯堵塞。 3.尘土将蒸发器芯体堵塞。	1.疏通或更换。 2.清理更换空调滤芯。 3.清洗蒸发器芯体。
冷、暖风同时工作制冷不好	暖风水阀未关或关闭不严。	检查关闭暖风水阀。
1.打开风速调节开关,风机不工作,指示灯不亮。 2.制冷灯亮,压缩机不吸合。	空调系统没电	1.检查保险和供电线路。 2.检查压力开关和压缩机线路。
系统高温、压力高、管路爆裂、压缩机抱死拉缸。	冷凝器散热不足,冷凝器表面有异物,冷凝器风扇坏。	经常清洗冷凝器,改善冷凝器散热条件,更换冷凝器散热风扇。
压缩机高低压侧在同一温度	系统没氟。系统内有堵塞。压缩机损坏。	加注冷媒。更换或疏通干燥瓶、膨胀阀堵塞点。更换压缩机。
暖风热力不足	水阀未开、发动机水温过低。	发动机水温升高后完全开启暖风水阀。
压缩机啸叫、高低压高于正常值	制冷剂加注过多。	从高压侧排出部分制冷剂。
压缩机不断开,工作半小时后制冷能力下降。	蒸发器芯体结冰	检查蒸发器内温度传感器是否安装合适。

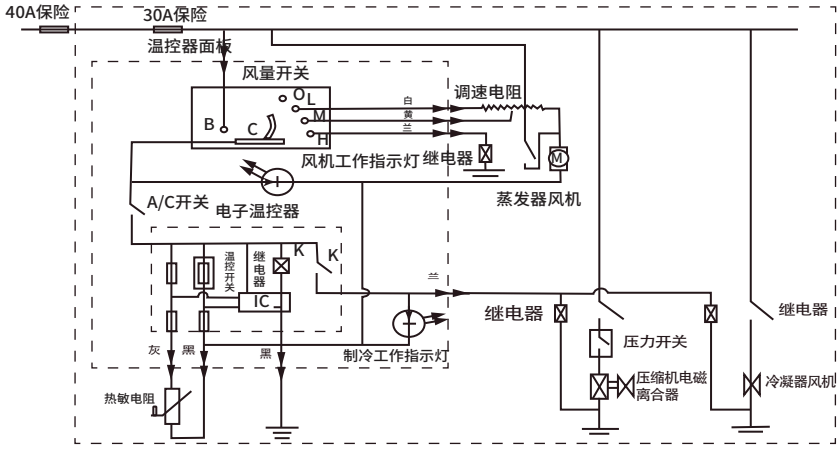
6.利用组合压力表检修空调状况



■6.1利用组合表检查分析空调系统故障:
6.1.1系统压力应为:低压:0.1～0.2MPa,高压:1.0～1.8MPa正常。
6.1.2 高压及低压都过低。储液瓶窗口有气泡;蒸发器出口温度不够冷,冷媒不足需补充冷媒。
6.1.3组合表高压低压都过高,冷气不冷。冷媒充填过量。或冷凝器面积不足,或冷凝器风扇风力不足,或冷凝器翅片不清洁 。
6.1.4 低压表有时负压真空,但有时压力正常,冷气不足,制冷系统有空气,系统内有水分,抽真空度不高。
6.1.5低压表为真空;高压表亦压力低;膨胀阀前后结霜;原因:管道或膨胀阀被污物或结冰堵塞。
6.1.6 高低压无压差,或压差小,空调不制冷,说明压缩机坏。

■ 6.2 保压测漏测试:
6.2.1 将组合表中间管下端接接在真空泵排气接接口。
6.2.2 开动真空泵,再打开组合表的高、低开关。
6.2.3 正常情况下,组合表的高、低压表指针会逐渐上升,当指针达到1.8Mpa-2.0Mpa时,关闭组合表的高、低开关,关闭真空泵。
6.2.4 使用测漏器检查各系统接头及可疑之处是否漏气,5分钟后检查仪表压力,注意压力是否下降,以判断是否漏气。
■6.3 抽真空(加氟准备):
6.3.1 将组合表中间管下端接接在真空泵抽气接头上端。
6.3.2 开动真空泵,再打开组合表的高、低开关。
6.3.3 续抽5-10分钟。正常情况下,低压表指示负压-0.1-0.2MPa,(如不到这负压,可能系统漏气,应检查所有接头)然后继续抽真空5-10分钟。关闭高压、低压开关,并检查仪表压力,注意是否压力回升如回升说明系统存在漏气,应找到漏点修复后再抽真空。
■6.4 加冷冻机油:
(整机出厂时已加好,新机无需加。二次维修更换蒸发器需加注40-50ML;更换贮液器需加注15 -2 5ML;管路泄露需加注10-30ML;更换冷凝器需加注40-5ML,更新压缩机时无需加注。)
6.4.1真空后接着加油。选用RFL-100X号油。关闭低压开关,打开高压开关,组合表高压管仍接在压缩机高压接头。中间管接在真空泵上。低压管要从组合表拆下。
6.4.2低压管接头接在压缩机低压接头,另一头插入油罐,油罐油量约100～200CC,根据空调管长度 而定。
6.4.3开动真空泵,利用真空泵将冷冻油吸入压缩机内。
6.4.4加注完冷冻油后将低压管接头从油罐取出并连接到组合表上,继续抽真空5min,然后依次关闭高压表及真空泵。
■6.5 加冷媒:
6.5.1将组合表中间管下端接上冷媒瓶,关闭组合表的高、低开关,然后打开瓶上开关,灌入冷媒。
6.5.2按组合表中间管上的排气阀,排出中间管内空气。然后打开组合表低压开关。
6.5.3启动发动机,再接通空调系统压缩机,利用压缩机吸入冷媒。注意高压压力表达到 1.2～1.8MPa 时,立即关闭低压开关,这时低压压力0.1～0.2MPa为正常(发动机在高转速工作,空调风机风速及制冷在最大位置)如果高压过低 , 则继续加入冷媒;如果高压过高,可能冷媒量太多,需由低压口排掉部分冷媒。(不同型号产品,冷媒加注量不同,详情咨询公司技术标定标准)
6.5.4关闭组合表低压开关,停下发动机及关闭压缩机,拆下组合表中间管接头,拆下组合表高、低压接头。加冷媒完成,卸接头动作要迅速以免冷媒外泄冻伤手部。

7.典型电路原理图



由于产品不断升级，电路图因型号不同可能有所改动，恕不另行通知。

8.主要技术参数

型号		SDKB系列
制冷量 ≥3000W		制热量 ≥4500W
蒸发器风量		450m³/h
蒸发器风速调节		高100%，中75%，低50%
耗电量	风机	≤300W
	离合器	48W
	电子扇	见风机参数
电压		12V/24V
制冷剂		HFC—134a（环保型）

9.技术服务及产品保修

感谢您使用康堡车用空调系统，愿我们的产品能为您提供舒适的工作环境。请您在使用空调前认真阅读《车用空调系统使用说明书》，以便正确操作。您在使用或维修空调时遇到问题请拨打服务电话：0539－3275988.我们会即时为您服务。

您也可以访问我们的官方网站：http://www.sdkangbao.net以获取更多产品资料和技术服务资讯。 我们随时恭候您，很乐意为您服务。

由于我们的产品不断升级改进，有时可能实际产品与说明书介绍不完全一致，谨此歉意。

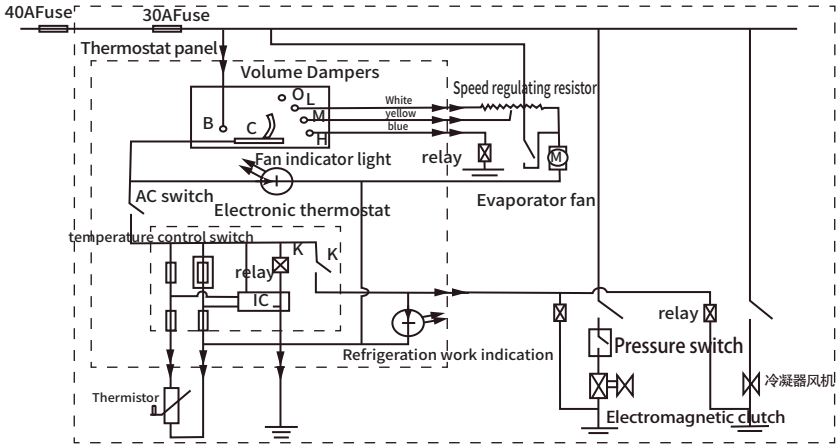
技术服务与产品保修条例：

①凡本公司生产的产品在保修期内，非其他原因造成的一切质量问题，一律实行三包服务。

②凡本公司生产的产品，非产品自身的质量问题，本公司实行终身技术服务。

③凡使用本公司生产的产品，对用户一律终身实行技术咨询。

7.The circuit principle diagram



8.Product technical parameters

model		SDKB K
Cooling capacity ⩾ 3000W		Heating capacity ⩾4500W
Air exchange rate		450m³/h
fan speed		H100%, M75%, L50%
Power consumption	Blower	⩽300W
	Compressor clutch	48W
	Fan	See fan parameters
Voltage		12V/24V
cryogen		HFC—134a

9.Product technical parameters quality warranty

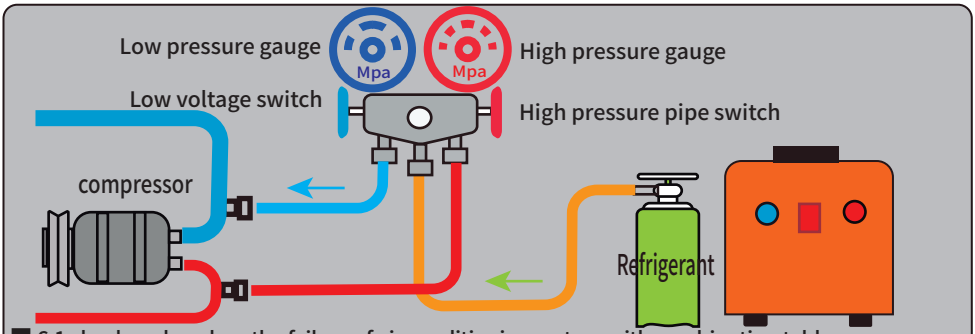
Thank you for using Kangbao air conditioning system. We hope our products can pr -ovide you with a comfortable working environment. Please read this manual carefully before using the air conditioner for correct operation. Please dial the Service Tel: 0539-3275988. We will be at your service immediately.

① According to the national regulations, we will implement Three Guarantees service. ③ Any use of the company's products, users are lifelong implementation of technical cons -ultation.

You can also visit our official website: http://www.sdkangbao.net To obtain more product information and technical service Business information. We are always waiting for you and will be happy to serve you.

Due to the continuous upgrading and improvement of our products, sometimes the actual products may not be completely consistent with the instructions. We are sorry.

6.The method of checking and repairing automobile air conditioner with combined pressure gauge



■ 6.1 check and analyze the failure of air conditioning system with combination table:

6.1.1 the system pressure should be: low pressure: 0.1 ~ 0.2MPa, high pressure: 1.0 ~ 1.8MPa, normal.

6.1.2 both high and low pressure are too low. There are bubbles in the window of the liquid storage bottle; the outlet temperature of the evaporator is not cold enough, and the refrigerant needs to be supplemented.

6.1.3 the high pressure and low pressure of the combined meter are too high, and the cold air is not cold. Excessive refrigerant filling. Or the area of condenser is insufficient, or the wind power of cond -enser fan is insufficient,
The fins are not clean.

6.1.4 the low pressure gauge sometimes has negative pressure and vacuum, but sometimes the pre -ssure is normal and the air conditioner is insufficient. There is air in the refrigeration system and the -re is moisture in the system, so the vacuum degree is not high.

6.1.5 the low pressure gauge is vacuum; the high pressure gauge is also low; the front and rear of the - expansion valve are frosted; the reason is that the pipeline or expansion valve is blocked by dirt or ice.

6.1.6 if there is no pressure difference between high and low pressure, or the pressure difference is s -mall, and the air conditioner is not cooled, it indicates that the compressor is broken.

■ 6.2 pressure maintaining leakage test:

6.2.1 connect the lower end of the middle pipe of the combination instrument to the exhaust connector of the vacuum pump.

6.2.2 start the vacuum pump and turn on the high-low switch of the combination instrument.

6.2.3 under normal conditions, the high and low pressure indicators of the combination instr ument increase gradually. When the pointer reaches 1.8 mpa-2.0 MPa, turn off the high-low swi -tch of the combination instrument and turn off the vacuum pump.

After 5 minutes, check whether the instrument pressure drops and whether the instrument pressure drops.

■ 6.3 vacuumization (preparation for fluorination)

6.3.1 connect the lower end of the middle pipe of the instrument cluster to the suction joint of the vacuum pump.

6.3.2 start the vacuum pump and turn on the high-low switch of the combination instrument.

6.3.3 continue pumping for 10 minutes. Under normal conditions, the low pressure gauge sho -ws negative pressure of -0.1-0.2mpa. (if the negative pressure is not reached, there may be air leakage in the system, all joints should be checked), and then continue to vacuum for 10 minut -es. Close the high and low pressure switch, check the instrument pressure, and pay attention to whether the pressure rises again. If the pressure increases, the system is leaking. The leaka -ge point should be found and repaired before vacuumizing.

■ 6.4 add refrigerant oil:

(the whole machine has been added before delivery, so it is not necessary to add it to the new machine. For the second maintenance, it takes 40-50ml to replace the evaporator, 15-25ml to replace the liquid storage tank, 10-30ml to fill for pipeline leakage, and 40-5ml to replace the condenser, which is not necessary to replace the compressor.)

6.4.1 refuel after vacuum. Rfl-100x oil was selected. Turn off the low voltage switch and turn on the high voltage switch. The high-pressure pipe of the instrument cluster is still connected to the high-pressure connector of the compressor. The intermediate pipe is connected to the vacuum

pump. The low pressure pipe should be removed from the instrument cluster.
6.4.2 connect the low pressure pipe connector of the compressor with the other end inserted into the oil tank. The amount of oil in the tank is about 100-200cc, depending on the length of the air c -onditioning pipe.
6.4.3 start the vacuum pump and suck the refrigerant oil into the compressor with the vacuum pump.
6.4.4 after filling the refrigerant oil, take out the low-pressure pipe joint from the oil tank and conn -ect it to the combination instrument, continue to vacuum for 5min, and then turn off the high pre -ssure successively High voltage switch and vacuum pump.

■ 6.5 add refrigerant:

6.5.1 connect the lower end of the middle pipe of the combination instrument with the refrigerant , turn off the high-low switch of the combination instrument, and then turn on the switch on the c -ombination instrument to fill the refrigerant.
6.5.2 according to the exhaust valve on the middle pipe of the combination instrument, exhaust th -e air in the intermediate pipe. Then turn on the low pressure switch of the instrument cluster.
6.5.3 start the engine, turn on the compressor of the air conditioning system, and inhale the refrig -erant with the compressor. Note that when the high pressure reaches 1.2-1.8mpa,
Close the low-voltage switch immediately, and the low-voltage of 0.1-0.2mpa is normal. (when the engine runs at high speed, the air conditioning fan has the highest wind speed and cooling capaci -ty
If the high pressure is too low, continue to add refrigerant; if the high pressure is too high, there m -ay be too much refrigerant, and some refrigerant needs to be discharged from the low pressure p -ort.
(different models of products have different refrigerant charge, see the company's technical calibr -ation standards for details)
6.5.4 turn off the low-pressure switch of the combination instrument, stop the engine, turn off the compressor, remove the middle pipe joint of the combination instrument, and remove the high an -d low pressure connector of the combination instrument.
When filling refrigerant, the connector should be removed quickly to avoid refrigerant leakage and frostbite on hands.

5.Common troubleshooting

■ 5.1 air conditioning does not work

If the electromagnetic clutch of compressor is normal, whether there is enough refrigerant in the system should be considered and tested with pressure gauge. Generally, the low pressure side pr -essure is 0.1-0.2mp, and the high-pressure side pressure is 1.0-1.8mp. If the high pressure pressu -re is too low, refrigerant needs to be added. Check whether there is leakage at the pipe joint. If th -ere is a leak, refill the refrigerant after repair.

■ 5.2 the refrigeration capacity of air conditioning is weak

The cooling capacity of the air conditioner is weak and the heat dissipation function of the conde -nser fails. Therefore, the heat dissipation condition of the condenser should be improved to mak -e the condenser have sufficient heat dissipation capacity. If the condenser is short of heat dissipa -tion for a long time (impurities, dust blockage, condensate fan failure), the compressor will work for a long time under high pressure and high power state, which will cause damage to the compr -essor.

■ 5.3 the refrigeration capacity of the air conditioner is weak, the outlet of the evaporator is small, and the air exchange capacity of the air conditioner is insufficient.Generally, it is caused by the du -st blocking the air inlet filter element of the air conditioning system, so it is necessary to replace the air conditioning filter element or clean the filter element. If dust enters the evaporator core, f -urther opening of the evaporator and cleaning of the evaporator core are required.

■ 5.4 the suction pressure of compressor is too low and there is negative pressure.The electroma gnetic clutch of the compressor is closed frequently. Generally, the drying bottle or expansion valv e is blocked, and it is generally cleaned or replaced.

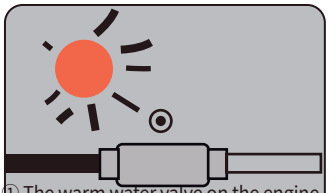
■ 5.5 water spray or water leakage at air outlet.

Under normal conditions, because the temperature of evaporator core body is lower than the am bient temperature, the water in the air is cooled and condensed, and the drain pipe is blocked or the drainage is not smooth, resulting in condensate water ejecting from the air outlet

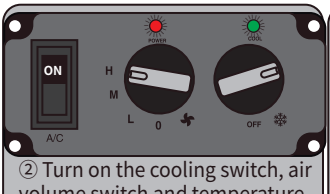
4.Maintenance items

■ 4.1 regularly check and clean the condenser (it is recommended to clean it once per shift), and the radiator shall be clean and free of blockage.
■ 4.2 check whether the compressor drive belt is loose or aged regularly (100 hours is recommen -ded), and adjust or replace if any. Check whether the fixing bolts of compressor bracket are loose. If yes, please fasten it in time.
■ 4.3 after the air conditioner operates for a period of time, check whether the connecting parts and hose joints are loose, and whether the hose is damaged or aged.
■ 4.4 whether the fan of condenser and evaporator can operate conveniently. Prevent foreign ma tters from blocking the fan blade or blocking the fan bearing due to lack of oil.
■ 4.5 check all electrical connectors and wires for defects and repair them in time.
■ 4.6 the refrigerant in the air conditioning system will leak slowly. Under normal circumstances, it should be supplemented once a year. After a large amount of leakage, before adding refrigerant, the appropriate amount of refrigerant oil should be added.

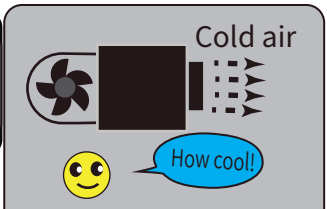
3. Precautions



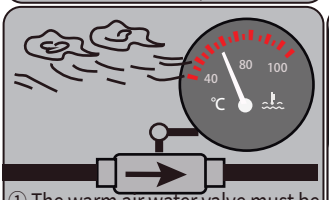
① The warm water valve on the engine must be closed;
(ignore this step for models equipped with electric water valve))



② Turn on the cooling switch, air volume switch and temperature control switch in turn, and select different temperatures according to the needs.

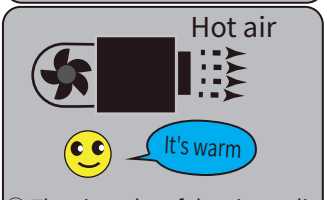


③ The air conditioner can blow out cool air.



① The warm air water valve must be opened manually;
(ignore this step for models equipp ed with electric water valve)

② Just turn on the air volume switc h. You can choose different wind sp eeds according to your needs..



③ The air outlet of the air condi -tioner can blow out warm heat..

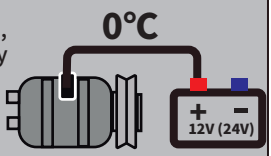
■ 3.1 operation
3.1.1 the air conditioner can only be used after the engine is started. When the engine is stopped, the air conditioner must be turned off first, and then the engine.
3.1.2 when using the refrigeration function, please turn off the warm air valve on the engine! Turn on the air volume switch, a / C switch , and the temperature control switch (rotate the temperatur -e control switch, the temperature setting is from high to low, and the air conditioning indicator co -ol is on. If the cold air is not used for a long time, the temperature control switch must be turned t o the off position, and the cool indicator light is not on).
3.1.3 when using warm air, open the warm air valve on the engine. After the engine water tempera -ture rises, just turn on the air volume switch to produce hot air, and the A / C switch must be in the off state.
3.1.4 for the air conditioner with overhead evaporator, a small amount of evaporation dew will spr -ay out when the locomotive is running, going up and down the slope, braking sharply or driving on the bumpy road

3.1.5 during normal operation, when the cab temperature rises to the start-up temperature, the co mpressor clutch closes, the compressor works and the system refrigeration works.
3.1.6 when the ambient temperature is lower than 0 °C, please fill the engine water tank with antif reeze of the local climate! To avoid freezing the heating equipment!

2.Precautions during installation

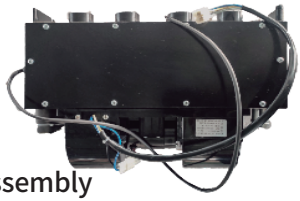
■ 2.1 installation of compressor: proper bracket shall be selected for fixation during installation of compressor. The support of compressor shall have enough rigidity and strength. The belt of compr -essor shall be convenient for adjustment and loading, and the tension shall be moderate. The liqu -id port of the compressor is upward, and the inclination is within + 15 degrees, otherwise the refrig -erant oil of the compressor is easy to be carried out, resulting in poor lubrication and easy damage to the compressor.
■ 2.2 when installing the evaporator, the drainage pipe should be ensured to drain smoothly, othe -rwise the evaporator is easy to accumulate water, which will cause the water to spray out from the evaporator outlet, which will affect the use experience.
■ 2.3 wire harness and pipeline should be far away from high temperature parts such as engine ex -haust pipe, otherwise the equipment may be damaged.
■ 2.4 attention should be paid to keep the pipeline clean during the installation, to avoid the inter -nal opening of the pipeline exposed to the air, and to avoid the entry of impurities and moisture in -to the pipeline. Otherwise, the air conditioner may not work normally.
■ 2.5 during pipeline installation, proper amount of refrigerant oil shall be applied on each pipelin -e interface and O-type sealing rubber ring, and butt joint shall be conducted carefully to prevent air leakage caused by dislocation and damage of O-ring.
■ 2.6 when tightening or loosening the air-conditioning pipe joint, two spanners must be used wit -h proper torque, otherwise the screw thread may be damaged.
■ 2.7 when installing the condenser, the appropriate bracket should be selected, and the core bod -y should not be subjected to external collision and pulling force, otherwise the condenser will be deformed or cracked. Pay attention to the installation position should have good heat dissipation conditions, and optimize the heat dissipation conditions as far as possible.
■ 2.8 the plugs of all parts of the harness must be inserted correctly and firmly, otherwise the con trol system may be out of control due to poor contact

■ 2.9 when filling refrigerant in low temperature environment, the am -bient temperature is lower than the set value of the sensor, resulting in low temperature protection, the compressor can not be powered on, resulting in difficult filling. The compressor can be directly powered by the positive battery to make the electromagnetic clutch work. If it is a cold and warm air conditioner, you can also start the engine and turn on the warm air. When the temperature in the cab increases, the comp -ressor can work normally.



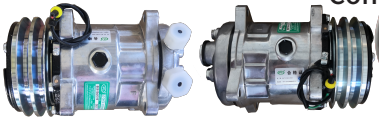
Some examples of our company's products


Evaporator assembly




Condenser assembly


Condenser assembly


compressor


control panel

1.Product composition and working principle

Air conditioning system is composed of refrigeration system, heating syste -m and control system.

■ 1.4 control system composition and working principle:

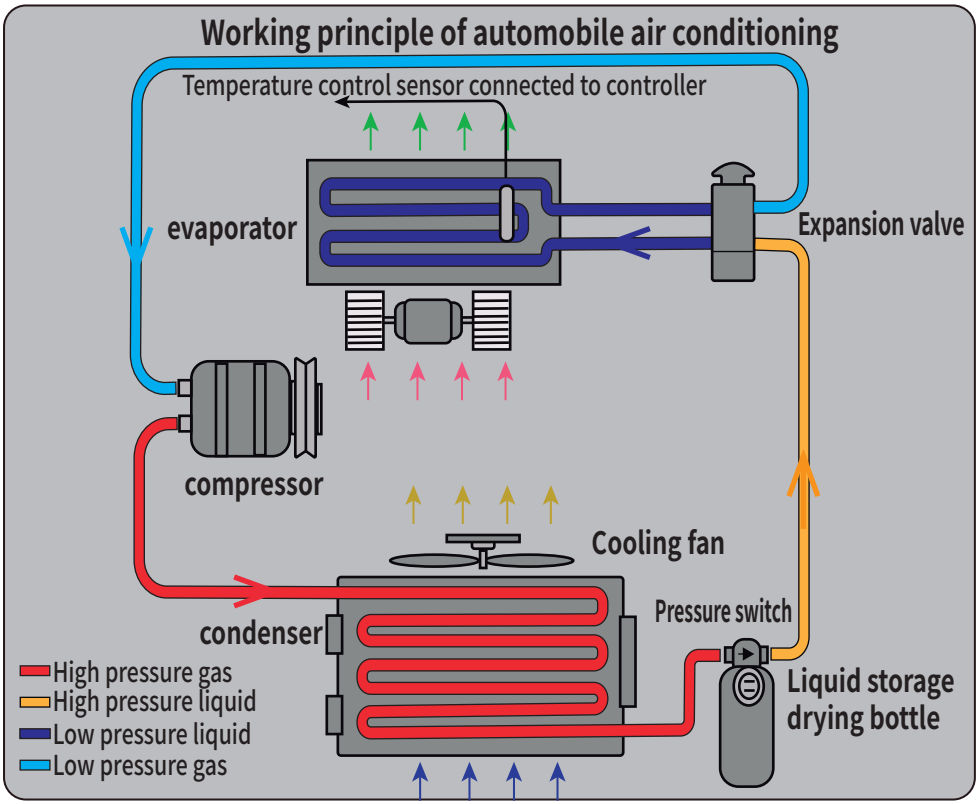
1.4.1 the air conditioning fan is equipped with three speed fan speed, whic -h is controlled by the control panel.

1.4.2 in order to ensure the normal operation of the system, the system ado -pts pressure switch to control high and low voltage protection.

1.4.3 the cooling temperature is controlled by the temperature setting swit -ch on the control panel.

1.4.4 the main switch of the refrigeration system is controlled by the rocker - switch on the control panel.

1.4.5 refrigeration system and heating system are relatively independent, w -hich can be selected according to needs.



Safety precautions: (read before use)

Dear kangbao users, welcome to use the air conditioner. In order to bett -er read this manual,
we will explain the signs as follows:

Any content with the "warning" sign must be operated in strict accordance with the warning content in respect of product safety or personal safety of users, otherwise, it may cause product functional failure or cause potential harm to users.

Any content with the "Prohibition" sign is absolutely prohibited, otherwise it may cause product damage or endanger the personal safety of users.

■ It is forbidden to install the products that do not conform to the voltage of the applic −able vehicle,Before installation, it is necessary to check when selecting products, and make sure to select the products that are consistent with the voltage of the vehicle type, otherwise, the air conditioner may not work, or the product may be burnt out, or even cause fire and endanger safety.

■ Do not touch the fan blade, compressor, high-pressure air conditioning pipeline and condenser surface during the operation of the air conditioner, or it will endanger the saf −ety and cause injury.

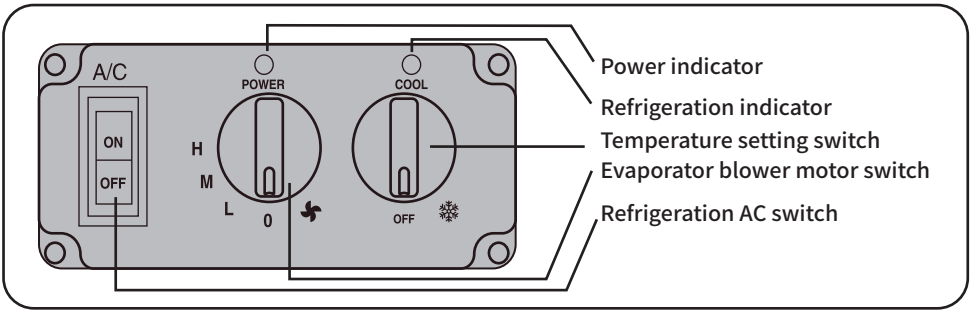
■ When filling refrigerant, do not let the refrigerant touch the naked skin, other wise it may cause frostbite.

■ When installing the product, it should be installed in strict accordance with the technical design process, otherwise the product may not work normally or the performance of the product design may not be achieved.

■ when using, the condenser must be kept in good heat dissipation performance, otherwise it may cause system functional failure or product performance degradation.

■ When replacing the fuse, the fuse with proper capacity should be selected, other wise the equipment will not work normally. May cause the equipment to burn down.

Description of common mechanical general air conditioning control panel:
The control panel consists of AC air conditioning switch, wind speed switch and temperature setting switch. The AC air conditioning switch is used in the refrigeration mode. When it is tur -ned on, the air conditioning refrigeration module is powered on to participate in the work. w -ind speed switch controls the speed of the blower motor of the evaporator to adjust the air s -upply volume of the evaporator. The temperature setting switch knob is used to set the temp -erature. Rotate the temperature setting knob to set the temperature required by the refrigera -tion mode.



5.6Troubleshooting list of common air conditioning system

Phenomenological features	reason	Maintenance measures
No refrigeration	Fluorine deficiency	Check whether there is oil stain at the air conditioner connection. If t -here is any indication, fluorine is l -eaking here. Leak detection and refrigerant sup -plement.
The wind is weak	1. The ventilation pipelin e is blocked. 2. The filter element at t -he air inlet of evaporato -r is blocked. 3. Dust blocks the evaporator core.	1. Dredge or replace. 2. Clean and replace the air condit ioner filter element. 3. Clean the evaporator core.
There is no temperature differe -nce between high and low pre ssure pipes of compressor	There's no fluoride in the system. There is a blockage in the system. The compressor is damaged.	Add refrigerant. Change or dredge the b lockage point of drying bottle and expa -nsion valve. Replace the compressor
Compressor squeal, high and lo -w pressure above normal value.	Excessive refrigerant charge.	Drain part of the refrigerant from the hig -h pressure side.
The compressor keeps on runni -ng, and the cooling capacity de -creases.	Evaporator core freezing	Check whether the temperature sensor in the evaporator is installed properly.
1. Turn on the wind speed r -egulation switch, the fan d -oes not work and the indic -ator light is not on. 2. The refrigeration lamp is on and the compressor do es not pull in。	Air conditioning system power fa ilure or circuit failure	1. Check the insurance and power supp -ly lines. 2. Check pressure switch and compress -or circuit.
Cold and warm air work at the same time, the refrige ration is not good	The warm air water valve is not closed or not tightly clo sed.	When the engine water temperatu -re rises, fully open the warm air w -ater valve.
System high temperature, high pressure, pipeline bu -rst, compressor lock cylin -der.	The heat dissipation of the conde -nser is insufficient, there are fore -ign matters on the surface of the condenser, and the fan of the con -denser is broken.	Often clean the condenser, improve the cooling conditions of the condenser, an -d replace the condenser cooling fan.

SDKB®

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Automobile air conditioner system
Operation and installation instructions

*This manual is applicable to Shandong Kangbao split mechanical vehicle air conditioner system

KB series air conditioning series are suitable for tractors, harvesters, construction machinery and other vehicles. the appearance shall be subject to the actual products.

Please read this manual carefully before use.
The company reserves the right to interpret the instructions.
Please refer to the real product for appearance.
Please keep it together with the invoice after reading.
in case of product technology or software upgrade, we will not inform you otherwise.
This manual is for the convenience of customers and users to understand the use of the product.
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