

SPARK

Resistant Requirements | Brochure |



LOREN COOK COMPANY



SPARK RESISTANT GUIDELINES

There are three levels of AMCA Spark Resistance Construction described in the AMCA 99 Standards Handbook. This brochure provides the requirements necessary for each product based on our interpretation of the AMCA 99 Standards Handbook.

AMCA A

All parts of the Air Moving Device (AMD) in contact with the air or gas being handled shall be made of non-ferrous material.



AMCA B

The AMD shall have an entirely non-ferrous wheel or impeller and non-ferrous ring about the opening through which the shaft passes.



AMCA C

The AMD shall be so constructed that a shift of the wheel or impeller or shaft will not permit two ferrous parts of the AMD to rub or strike.



ADDITIONAL NOTES

***Products not listed in this guide do not meet AMCA Spark Resistance Construction standards, and are therefore not advertised.**

1. No bearings, drive components, motors or other electrical devices shall be placed in the air or gas stream unless they are constructed or enclosed in such a manner that failure of that component cannot ignite the surrounding gas stream.
2. The user shall electrically ground all fan and/or damper parts.
3. For this standard, nonferrous material shall be any material with less than 5% iron or any other material with demonstrated ability to be spark resistant.
4. All structural components within the airstream, including non-metallic materials, must be suitable for conducting static charge safely to ground, thus preventing buildup of electrical potential. Dampers with non-metallic bearings must include means by manufacturer of transferring electrical charge from the blades to suitable ground.
5. The use of aluminum or aluminum alloys in the presence of steel that has been allowed to rust requires special consideration. Research by the U.S. Bureau of Mines and others has shown that aluminum impellers rubbing on rusty steel may cause high intensity sparking.



SPARK RESISTANT MISCONCEPTIONS

Classification for Spark Resistant Construction from AMCA Standard 99 is a set of guidelines for manufacturers. The manufacturer has to interpret these guidelines and establish construction requirements for their products.

COMMON MISCONCEPTIONS

A common misconception is that spark resistant construction is a certification. Currently, there is neither testing protocol nor a certification program for spark resistant construction.

Specifying an AMCA Spark-Proof Fan or Explosion-Proof Fan

- There is not such thing as 'spark-proof' or 'explosion proof' fans.
- AMCA has spark resistant construction guidelines. Fan companies apply those guidelines to the construction of their products.
- In addition, the drawings, specification or fan schedule must define a level of AMCA spark resistant construction.

Specifying a Class, Group, and Division of Operating Environment as a Substitute for Fan Construction

- Class, Group, and Division is for specifying electrical components, not fans.
- This classification can mean the atmosphere of the location of the fan, but the airstream can be different and possibly more severe or dangerous.

An Explosion-Proof Motor Will Make a Fan Spark Resistant

- Spark resistant construction is about the airstream.
- Based on the construction of the fan, the motor can be exposed to a completely different environment than the airstream.



WARNING

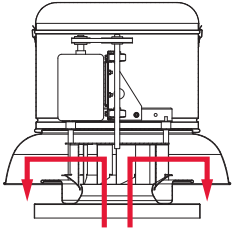
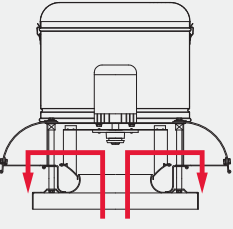
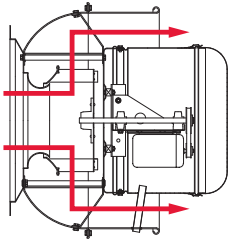


The use of AMCA Spark Resistance in no way implies a guarantee of safety for any level of spark resistance. Spark resistant construction also does not protect against ignition of explosive gases caused by catastrophic failure or from any airstream material that may be present in a system.

Adapted from AMCA Standard 99

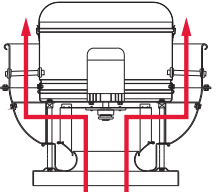
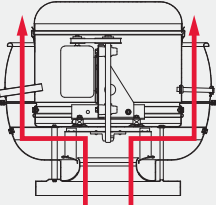


POWER ROOF VENTILATORS

UNIT TYPE	AMCA A	AMCA B	AMCA C	
	<p>ACE-B</p>	<ul style="list-style-type: none">▪ Add aluminum support plate (120+)▪ Add stainless steel shaft and airstream hardware▪ Add spark-resistant conduit	<ul style="list-style-type: none">▪ Add aluminum support plate (120+)▪ Standard (60-100)	<ul style="list-style-type: none">▪ Add aluminum support plate (120+)▪ Standard (60-100)
	<p>ACE-D</p>	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum support plate (120+)▪ Add stainless steel airstream hardware▪ Add spark-resistant conduit	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum support plate (120+)	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum support plate (120+)
	<p>ACW-B</p>	<ul style="list-style-type: none">▪ Add (2) aluminum motor plates▪ Add stainless steel shaft and airstream hardware▪ Add spark-resistant conduit and cooling tube	<ul style="list-style-type: none">▪ Add aluminum motor plate	<ul style="list-style-type: none">▪ Add aluminum motor plate

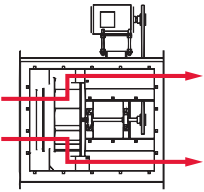
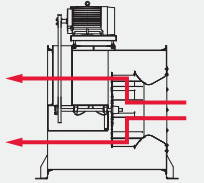
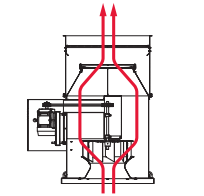
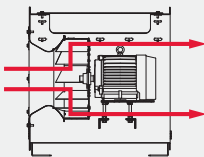


POWER ROOF VENTILATORS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>ACW-D ACRU-D (STD./HP/XP)</p>	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum motor plate▪ Add stainless steel airstream hardware▪ Add spark-resistant conduit and cooling tube	<ul style="list-style-type: none">▪ Requires explosion-proof motor (motor's size is limited due to excess weight)▪ Add aluminum motor plate
	<p>ACRU-B/HP/XP VCR-B/HP/XP</p>	<ul style="list-style-type: none">▪ Add aluminum motor plate▪ Add stainless steel shaft and airstream hardware▪ Add spark-resistant conduit and cooling tube	<ul style="list-style-type: none">▪ Add aluminum motor plate

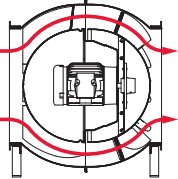
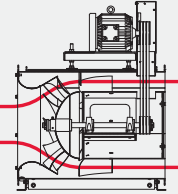
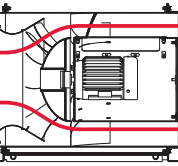


CENTRIFUGAL VENTILATORS & BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	SQUI-B <ul style="list-style-type: none">All aluminum airstreamStainless steel shaft and hardwareAdd shaft seal/1pc bearing housing coverUse steel (Lorenized™) mounting feet	<ul style="list-style-type: none">Add stainless steel shaftAdd shaft seal1pc bearing housing cover	<ul style="list-style-type: none">Add shaft seal1pc bearing housing cover
	TCN-B TCNH-B <ul style="list-style-type: none">Add all aluminum airstreamAdd stainless steel hardwareAdd shaft seal	<ul style="list-style-type: none">Add aluminum wheel (TCNH)Add shaft seal	<ul style="list-style-type: none">Add shaft seal
	TCNU TCNHU <ul style="list-style-type: none">Add all aluminum airstreamAdd stainless steel hardwareAdd shaft seal	<ul style="list-style-type: none">Add aluminum wheel (TCNHU)Add shaft seal	<ul style="list-style-type: none">Add shaft seal
	TCN-D <ul style="list-style-type: none">Requires explosion-proof motorAdd all aluminum airstream	<ul style="list-style-type: none">Requires explosion-proof motor	<ul style="list-style-type: none">Requires explosion-proof motor



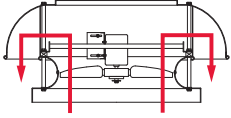
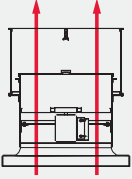
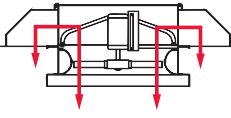
CENTRIFUGAL INLINE VENTILATORS & BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>CVD*</p>	<ul style="list-style-type: none"> Requires explosion-proof motor Add stainless steel hardware 	<ul style="list-style-type: none"> Requires explosion-proof motor
	<p>QMX/HP/XP QMXU/HP/XP (ARR 9 ONLY)</p>	<ul style="list-style-type: none"> Add all aluminum airstream Add stainless steel hardware and shaft seal Add enclosed belt tunnel Aluminum dampers (QMXU) 	<ul style="list-style-type: none"> Add rub ring Add shaft seal Add enclosed belt tunnel Add aluminum wheel
	<p>QMXD QMXHPD QMXXPD</p>	<ul style="list-style-type: none"> Requires explosion-proof motor Add stainless steel hardware Add all aluminum construction Requires bifurcated housing 	<ul style="list-style-type: none"> Requires TEFC motor Recommend explosion-proof motor Requires bifurcated housing Add Rub ring Add Shaft seal

*CVD limited availability due to explosion-proof motor not fitting inside fan. Consult factory.

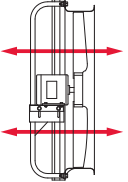
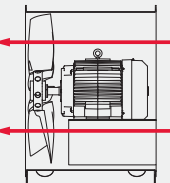


PROPELLER ROOF VENTILATORS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	AQD	*NOT AVAILABLE ON SIZE 12 <ul style="list-style-type: none">Requires explosion-proof motorAdd stainless steel hardwareAdd aluminum power assembly	<ul style="list-style-type: none">Requires explosion-proof motor
	AUD/EUD	<ul style="list-style-type: none">Requires explosion-proof motorAdd stainless steel hardwareAdd all aluminum construction	<ul style="list-style-type: none">Requires explosion-proof motor
	HEE/HES/HEF (DIRECT) LEU-D/HER-D	<ul style="list-style-type: none">Requires explosion-proof motorAdd stainless steel hardwareAdd all aluminum construction	-

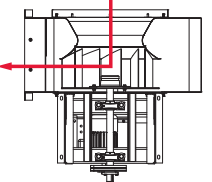
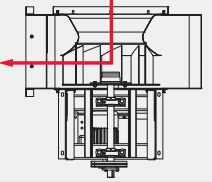
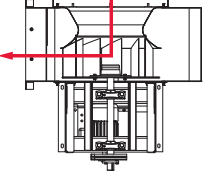
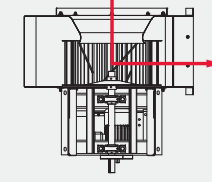


PROPELLER WALL & INLINE VENTILATORS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	AWD/EWD ADD/EDD XWHD*	*NOT AVAILABLE ON XWHD <ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add stainless steel hardware▪ Add all aluminum construction	<ul style="list-style-type: none">▪ Requires explosion-proof motor
	AI	-	<ul style="list-style-type: none">▪ Requires explosion-proof motor

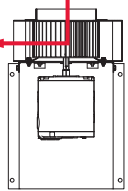
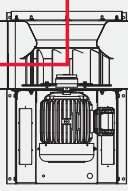
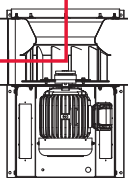
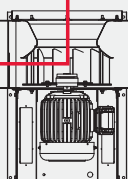


VENT SETS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	CPA/CPA-A (ARR. 10 ONLY) <ul style="list-style-type: none">▪ Standard	<ul style="list-style-type: none">▪ Standard	<ul style="list-style-type: none">▪ Standard
	CPS/CPS-A (ARR. 10 ONLY) <ul style="list-style-type: none">-	<ul style="list-style-type: none">▪ Add rub ring▪ Add aluminum wheel	<ul style="list-style-type: none">▪ Add rub ring
	CPV (ARR. 10 ONLY) <ul style="list-style-type: none">▪ Add aluminum housing▪ Add stainless steel shaft and hardware	<ul style="list-style-type: none">▪ Add rub ring	<ul style="list-style-type: none">▪ Add rub ring
	CPFB <ul style="list-style-type: none">-	<ul style="list-style-type: none">-	<ul style="list-style-type: none">▪ Add rub ring

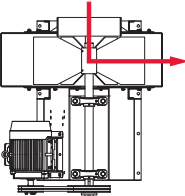
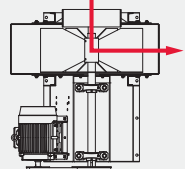
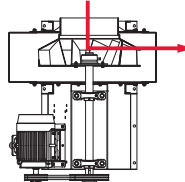


VENT SETS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>CPFD</p>	<ul style="list-style-type: none"> ▪ Add aluminum wheel and housing ▪ Consult engineering 	<ul style="list-style-type: none"> ▪ Add aluminum wheel ▪ Add rub ring ▪ Consult engineering
	<p>CPA/CPA-A (ARR. 4 ONLY)</p>	<ul style="list-style-type: none"> ▪ Requires explosion-proof motor 	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add shaft seal
	<p>CPS/CPS-A (ARR. 4 ONLY)</p>	<p>-</p>	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add rub ring ▪ Add shaft seal ▪ Add aluminum wheel
	<p>CPV (ARR. 4 ONLY)</p>	<ul style="list-style-type: none"> ▪ Requires explosion-proof motor ▪ Add aluminum housing ▪ Add stainless steel hardware 	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add rub ring ▪ Add shaft seal

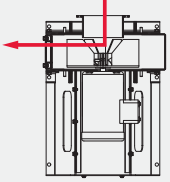
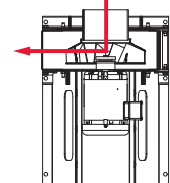


INDUSTRIAL MATERIAL HANDLERS

UNIT TYPE		AMCA A	AMCA B	AMCA C
	MH	<ul style="list-style-type: none">▪ Add aluminum construction of airstream parts▪ Add stainless steel shaft and hardware	<ul style="list-style-type: none">▪ Add rub ring▪ Add aluminum wheel	<ul style="list-style-type: none">▪ Add rub ring▪ Add special aluminum rub plates▪ Add special aluminum bolt-in inlet
	MHB	<ul style="list-style-type: none">▪ Add aluminum construction of airstream parts▪ Add stainless steel shaft and hardware	<ul style="list-style-type: none">▪ Add rub ring▪ Add aluminum wheel	<ul style="list-style-type: none">▪ Add rub ring▪ Add special aluminum rub plates
	MHA	<ul style="list-style-type: none">▪ Add aluminum construction of airstream parts▪ Add stainless steel shaft and hardware	<ul style="list-style-type: none">▪ Add rub ring▪ Add aluminum wheel	<ul style="list-style-type: none">▪ Add rub ring▪ Add aluminum wheel

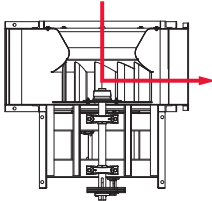
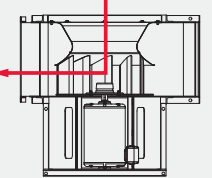


INDUSTRIAL MATERIAL HANDLERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>MHB (ARR. 4 ONLY)</p>	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum construction of airstream parts▪ Add stainless steel hardware	<ul style="list-style-type: none">▪ Requires TEFC motor▪ Recommend explosion-proof motor▪ Add rub ring▪ Add shaft seal▪ Add aluminum wheel (hub must cover shaft through housing)
	<p>MHA (ARR. 4 ONLY)</p>	<ul style="list-style-type: none">▪ Requires explosion-proof motor▪ Add aluminum construction of airstream parts▪ Add stainless steel hardware	<ul style="list-style-type: none">▪ Requires TEFC motor▪ Recommend explosion-proof motor▪ Add rub ring▪ Add shaft seal▪ Add aluminum wheel (hub must cover shaft through housing)

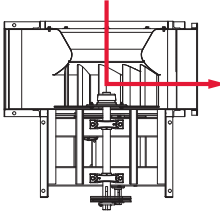
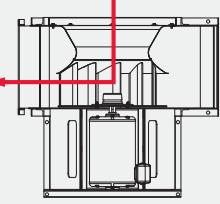


AIRFOIL CENTRIFUGAL BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>CA-SWSI (ARR. 1, 8, 9, 10) CA-4 SWSI (ARR. 1, 8, 9, 10) (SWING-OUT)</p>	<ul style="list-style-type: none"> ▪ Add aluminum housing ▪ Add aluminum wheel ▪ Add stainless steel shaft and hardware 	<ul style="list-style-type: none"> ▪ Add rub ring ▪ Add aluminum wheel
	<p>CA-SWSI (ARR. 4) CA-4 SWSI (ARR. 4) (SWING-OUT)</p>	<ul style="list-style-type: none"> ▪ Requires explosion-proof motor ▪ Add aluminum housing ▪ Add aluminum wheel ▪ Add stainless steel hardware 	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add rub ring ▪ Add shaft seal ▪ Add aluminum wheel

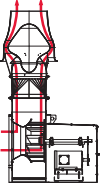
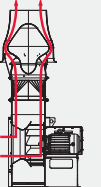
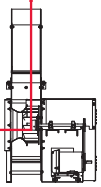
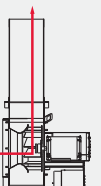


FLAT BLADE CENTRIFUGAL BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>CF-SWSI (ARR. 1, 8, 9, 10) CF-4 SWSI (ARR. 1, 8, 9, 10) (SWING-OUT)</p> <ul style="list-style-type: none"> ▪ Add aluminum housing ▪ Add aluminum wheel ▪ Add stainless steel shaft and hardware 	<ul style="list-style-type: none"> ▪ Add rub ring ▪ Add aluminum wheel 	<ul style="list-style-type: none"> ▪ Add rub ring ▪ Add aluminum inlet
	<p>CF-SWSI (ARR. 4) CF-4 SWSI (ARR. 4) (SWING-OUT)</p> <ul style="list-style-type: none"> ▪ Requires explosion-proof motor ▪ Add aluminum housing ▪ Add aluminum wheel ▪ Add stainless steel hardware 	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add rub ring ▪ Add aluminum wheel ▪ Add shaft seal 	<ul style="list-style-type: none"> ▪ Requires TEFC motor ▪ Recommend explosion-proof motor ▪ Add aluminum inlet ▪ Add shaft seal

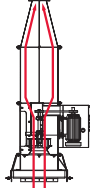
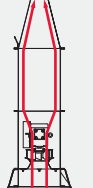
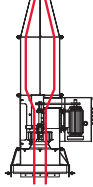
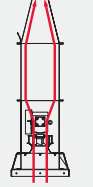


LABORATORY EXHAUST BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C
	<p>CAVP/CAVPS (ARR. 1, 8, 9, 10)</p> <ul style="list-style-type: none"> Add aluminum housing Add aluminum wheel 	<ul style="list-style-type: none"> Add aluminum wheel 	<ul style="list-style-type: none"> Standard
	<p>CAVP/CAVPS (ARR. 4)</p> <ul style="list-style-type: none"> Requires explosion-proof motor Add aluminum housing Add aluminum wheel 	<ul style="list-style-type: none"> Requires TEFC motor Recommend explosion-proof motor Add rub ring Add aluminum wheel Add shaft seal 	<ul style="list-style-type: none"> Requires TEFC motor Recommend explosion-proof motor Add shaft seal
	<p>CPSLE/-S CPSALE/-S CPSFE/CPSAFE (ARR. 10)</p> <ul style="list-style-type: none"> Add all aluminum airstream Add aluminum wheel Add shaft seal (recommended) 	<ul style="list-style-type: none"> Add rub ring Add aluminum wheel Add shaft seal (recommended) 	<ul style="list-style-type: none"> Add rub ring Add shaft seal (recommended)
	<p>CPSLE/-S CPSALE/-S CPSFE/CPSAFE (ARR. 4)</p> <ul style="list-style-type: none"> Requires explosion-proof motor Add all aluminum airstream Add aluminum wheel Add shaft seal (recommended) 	<ul style="list-style-type: none"> Requires TEFC motor Recommend explosion-proof motor Add rub ring Add shaft seal Add aluminum wheel 	<ul style="list-style-type: none"> Requires TEFC motor Recommend explosion-proof motor Add shaft seal

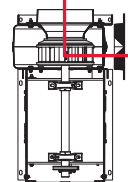


LABORATORY EXHAUST BLOWERS

UNIT TYPE	AMCA A	AMCA B	AMCA C	
	<p>QMX-LE/HP QMX-VP/HP QMX-VPA/HP (ARR. 9)</p>	<ul style="list-style-type: none"> Add all aluminum airstream 	<ul style="list-style-type: none"> Add aluminum wheel 	<ul style="list-style-type: none"> Standard
	<p>QMX-LE/HP QMX-VP/HP QMX-VPA/HP (ARR. 4)</p>	<ul style="list-style-type: none"> Requires explosion-proof motor Requires bifurcated housing Add all aluminum construction 	<ul style="list-style-type: none"> Requires TEFC motor Requires bifurcated housing Recommend explosion-proof motor Add rub ring Add shaft seal 	<ul style="list-style-type: none"> Requires TEFC motor Requires bifurcated housing Recommend explosion-proof motor Add shaft seal
	<p>TCNHBLE (ARR. 9)</p>	<ul style="list-style-type: none"> Add all aluminum airstream 	<ul style="list-style-type: none"> Standard 	<ul style="list-style-type: none"> Standard
	<p>TCNHDL</p>	<ul style="list-style-type: none"> Requires explosion-proof motor Add all aluminum airstream 	<ul style="list-style-type: none"> Requires explosion-proof motor 	<ul style="list-style-type: none"> Requires explosion-proof motor



FIBERGLASS

UNIT TYPE	SPARK RESISTANT CONSTRUCTION
	<p>FCEB FCED</p>
	<p>FCRUB FCRUD</p>
	<p>FCP</p>

ASTM D4167-21 Construction

- ASTM D4167-97 Standard for Fiber-Reinforced Plastic Fans and Blowers
- For corrosive systems where ASTM construction is specified, this construction option adds:
 - Synthetic veil
 - Electrostatically conductive surface coating applied to airstream housing and impeller surfaces
 - Special nameplates
 - Special final dynamic balancing to fan

