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AEGIS SGR™ CONDUCTIVE MICROFIBRE™
shaft grounding solutions

Morgan

AEGIS™ SGR
CONDUCTIVE MICROFIBER™ BRUSH

Application notes

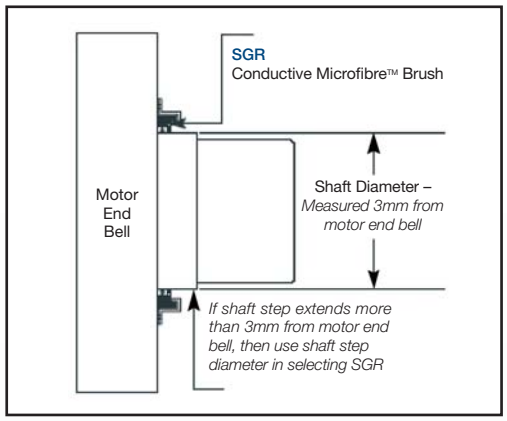
Selecting the right size AEGIS SGR™ for your motor

- **Step 1:** Measure shaft diameter at a point .125” (3mm) from motor end bell.
- **Step 2:** To select the correct AEGIS SGR™ part number, refer to the AEGIS SGR™ size chart provided.

If you have any questions, please call

- Morgan Industrial Carbon Customer Service on **+61 418 989 714**, or
- e-mail: **Aegis-SGR@morgancarbon.com.au**

for help with AEGIS SGR™ selection.

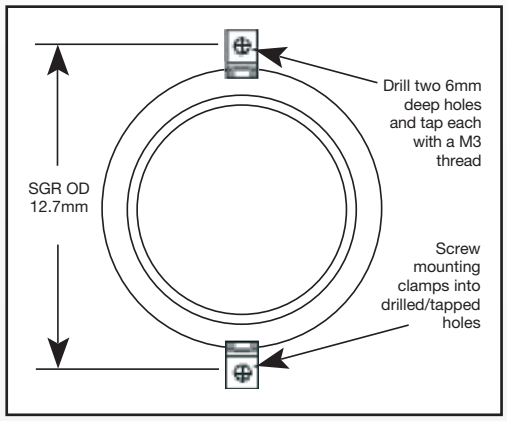


Installation

For proper operation and optimum performance, install AEGIS SGR™ so that:

- The Conductive MicroFibres™ touch the shaft for effective shaft grounding.
- The aluminium brush holder frame extends out from the motor end bell approximately 0.28” (7 mm).
- The aluminium brush holder frame has even clearance around the shaft.

1. Slide AEGIS SGR™ over motor shaft and position for even clearance around the shaft.
2. Drill two 0.25” (6mm) deep holes into the motor end bell and tap each with a M3 thread.
3. Lock AEGIS SGR™ in place by fastening brackets to motor end bell using screws provided.



Aegis SGR™ Conductive MicroFibre™

SHAFT GROUNDING BRUSH

PROBLEM

Induced shaft currents damage bearings

The use of variable-speed drives with AC motors induces electrical currents on the motor shaft. Once they exceed the resistance of the bearing lubricant, these currents discharge to ground (typically the motor housing), causing fusion craters in the bearings. Over time, these craters increase in size and number, resulting in frosting, pitting, fluting, and eventually bearing failure. This type of premature bearing failure can cost thousands of dollars in increased maintenance and lost production.

SOLUTION

AEGIS SGR™ – The world's most effective shaft grounding brush

The new AEGIS SGR™ Conductive MicroFibre™ shaft grounding brush prevents electrical damage to motor bearings by safely channeling harmful shaft currents to ground. Using proprietary Electron Transport Technology™, the conductive microfibres inside the AEGIS SGR™ provide the path of least resistance for damaging shaft currents, preventing electrical damage to motor bearings and dramatically extending motor life.

The longest lasting protection available

Not only is the AEGIS SGR™ the world's most effective grounding brush, it offers the longest lasting protection available.

- Maintenance-free
- Unaffected by dirt, grease, or other contaminants
- Lasts for life of motor

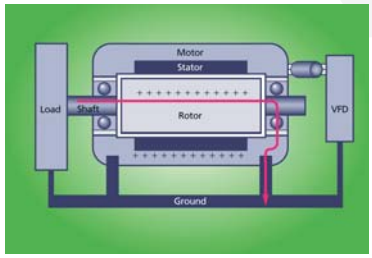
Fast, easy installation

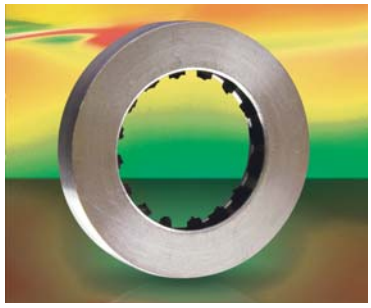
- Easily installed in minutes – even in the field
- Mounts on either end of motor shaft
- Simple screw-on mounting brackets
- No machining required

Sizes for most NEMA and IEC motors

Available in standard sizes for:

- NEMA and IEC frames
- Shaft diameters: 0.311" to 6.020" (8mm to 153mm)
- Larger sizes available upon request
- No RPM limitations





Motor frame size – IEC	Shaft size 2 pole (mm)	Shaft size 4, 6, 8 pole (mm)
71	14	14
80	19	19
90S	24	24
90L	24	24
100L	28	28
112M	28	28
132S	38	38
132M	38	38
160M	42	42
160L	42	42
180M	48	48
180L	48	48
200L	55	55
225S	55	60
225M	55	60
250M	60	65
280S	65	75
280M	65	75
315S	65	80
315M	65	80
315L	65	80
355M	75	95
355L	75	95

Please note that this shaft sizing is a guide only and the shaft should be properly measured before ordering any SGR product, it is also worth noting that the SGR is often easier to mount on the shaft shoulder immediately where it exits the motor end cap.

Product to suit larger frame sizes also available upon request.

About
SHAFT CURRENT

Comparison of technology to eliminate electrical damage to bearings

In the electrical AC motor industry, the use of variable speed drives greatly increases generation of electrical current on the shaft of the AC motor and causes electrical damage to bearings unless a mitigation strategy is employed.

Damaging shaft current is built up in AC motors when controlled by variable frequency drives (VFD) using pulse width modulation (PWM) to control the AC motors. These drives use insulated gate bipolar transistors (IGBT) with extremely high switching speeds which create common mode voltages because of the V/T due to parasitic capacitive coupling between the stator and rotor. The result is shaft current that discharges through the motor bearings from shaft to frame causing fusion craters in the bearing race wall, ultimately resulting in severe frosting and fluting. Without protection this phenomenon occurs immediately upon operation of the motor/drive system and continues until costly failure occurs.

AEGIS SGR™ shaft grounding ring provide a revolutionary solution to extend bearing life of the motor. The AEGIS SGR™ solution overcomes the obstacles encountered with the application of other technologies. Key AEGIS SGR™ benefits are:

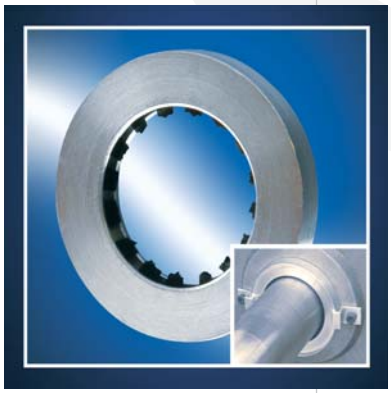
- Easy to install
- Long-term effectiveness
- Low lifetime cost
- Maintenance free

	AEGIS SGR™	Insulating sleeve	Ceramic bearing	Conductive grease	Carbon brush	Copper brush
Easy to install	Yes	No	N/A	N/A	No	No
Long-term effectiveness	Yes	No*	No*	No	No	No
Lifetime cost of solution	Low	Low	High	High	High	High
Maintenance free operation	Yes	Yes	Yes	No	No	No

**Shaft current is transferred to connected equipment*

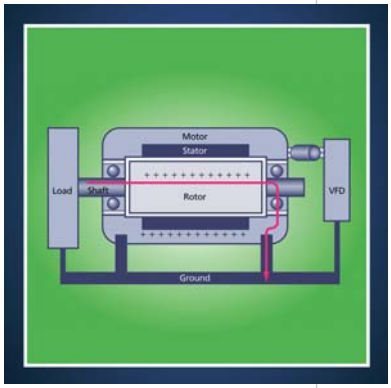
Easy to install

AEGIS SGR™ is easily installed with external mounting brackets that clamp directly on to the motor end bell. Installation may be on the drive end and/or the non-drive end of the motor, depending on the application. AEGIS SGR™ may also be press fit into the motor housing. Insulating sleeves and ceramic bearings are custom installations by the motor manufacturer or service shops. External copper or carbon brushes require special brackets for installation.



Long-term effectiveness

Continuous operating results from AEGIS SGR™ testing show consistent and highly reliable performance in the functional operation without any decrease in effectiveness over time. This is because AEGIS SGR™ works through the principle of ionization and patent pending Electron Transport Technology™. The AEGIS SGR™ solution provides a continuous discharge path for shaft current and extends bearing life by providing an alternate path for shaft current to bypass the bearings. Ceramic bearings and insulation sleeves prevent current from passing through the bearing race but do not remove the shaft voltages which may then be discharged through the load. Conductive grease will become less effective over time as the conductive particles separate. The grease also may not perform properly as a lubricant. Copper and carbon brushes become less effective over time because oxidation builds up on the shaft and dirt and grease reduce their conductivity.



Lifetime cost of solution

AEGIS SGR™ provide low cost solution with no parts to wear out and continuous operational effectiveness over the life of the motor. Ceramic bearings are costly to implement and require long lead times. Insulating sleeves are costly to install and may lose effectiveness if dirt and particles build up. They also cause greater heat build-up at the bearing which reduces bearing life. Conductive grease loses effectiveness over time and requires replacement which increases maintenance costs. Spring loaded brushes require maintenance and replacement which increase the lifetime costs.

Maintenance free operation

AEGIS SGR™ is maintenance free and highly reliable. Once AEGIS SGR™ is installed it continues to operate without any adjustment, replacement or maintenance with no frictional wear over time. Ceramic bearings are installed by motor manufacturers and should not require maintenance. Insulating sleeve may require maintenance if contamination builds up during operation. Conductive grease will require periodic replacement. All types of contact friction brushes (copper or carbon) require regular and careful maintenance to ensure their effectiveness.

Frequently asked QUESTIONS

Image 1: *Bearing frosting line on bearing race*

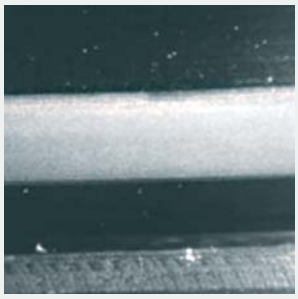


Image 2: *Bearing fluting, "washboard" pattern on bearing race*

1. What does bearing frosting look like?

Answer: Frosting will look like a grey or white line along the bearing race where the discharges take place (see Image 1).

2. What does bearing fluting look like?

Answer: Fluting will look like a washboard pattern of grey or white along the bearing race where the discharges take place (see Image 2).

3. Why are these shaft currents so destructive?

Answer: Because when motors are controlled by VFDs, they occur literally millions of times per minute while the motor is running. Over time the bearing race becomes heavily frosted and may start to flute in a very short period of time... sometimes causing failure in only a few months.

4. What happens to the motor as frosting and fluting take place in the bearings?

Answer: Vibration and bearing noise will continue to increase as the problem gets worse. This noise, caused by the bearing ball coming in contact with the fluting or severe frosting of the bearing race is an indicator of potential catastrophic failure. Installing the AEGIS SGR™ will divert the currents which cause the bearing failures away from the bearings and will discharge the currents to ground.

5. What makes the AEGIS SGR™ so reliable?

Answer: (1) The patent pending design ensures there is a high density of discharge points provided by the Conductive MicroFibre™ around the entire circumference of the shaft, diverting the unwanted shaft currents to ground; (2) The AEGIS SGR™ is maintenance free and there is nothing to wear out; (3) The AEGIS SGR™ is designed to be effective in oil, grease or in a contaminated dusty environment.

6. Why does the AEGIS SGR™ last so long?

Answer: AEGIS SGR™'s patent pending design applies virtually no frictional pressure of the fibres to the shaft and therefore there is no direct frictional wear applied to the fibre tips. The AEGIS SGR™ will literally last the service life of the motor.

7. What makes the AEGIS SGR™ so effective in discharging shaft current?

Answer: Because the optimum condition to discharge unwanted energy from a rotating shafts is created in the AEGIS SGR™ by completely surrounding the motor shaft with special conductive micro fibres. This is known as our patent pending Electron Transport Technology™ and ensures that potentially harmful shaft currents pass safely to ground.

8. How long will the AEGIS SGR™ Conductive MicroFibre™ shaft grounding brush last?

Answer: The AEGIS SGR™ will last for the normal service life of the motor and continue to discharge shaft currents.

9. Why don't the fibres wear over time?

Answer: The patent pending design ensures there is virtually no friction and therefore no wear. After 8700 hours of continuous testing the wear was not measurable with a micrometer.

10. Is any maintenance needed for the AEGIS SGR™ once it is installed?

Answer: AEGIS SGR™ technology is maintenance free and will not wear out. The special Conductive MicroFibres™ are extremely tough and will last for the service life of the motor.

11. Is AEGIS SGR™ affected by oil or grease?

Answer: AEGIS SGR™ is just as effective in an oily or greasy environment because the Conductive MicroFibres™ cut through the grease and oil and maintain their contact on the motor shaft to discharge shaft currents.

12. Do the AEGIS SGR™ Conductive MicroFibres™ touch the shaft?

Answer: There is an interference fit to the motor shaft surface 360 degrees around the shaft. The patent pending design ensures that the discharges take place to protect the motor bearings when the AEGIS SGR™ is installed properly.

13. Will AEGIS SGR™ remain equally effective during its long service life?

Answer: Yes – AEGIS SGR™ is designed not to wear out during the service life of the motor. This is because of the ultra-low friction between fibre and shaft which ensures long life while discharging takes place.

14. When should AEGIS SGR™ be replaced on the motor?

Answer: Even though AEGIS SGR™ lasts for the service life of the motor, it is a good idea to replace the AEGIS SGR™ at the same time the motor bearings are normally replaced.

15. Will the AEGIS SGR™ cause wear to the shaft of the motor?

Answer: The motor shaft will not wear because there is virtually no frictional force applied to the shaft. Therefore there is no measurable wear of the shaft, even after over 8700 hours of continuous operation.

16. Why do conventional shaft grounding brushes wear out?

Answer: Metal bristle or carbon block conventional shaft grounding brushes use a spring loaded mechanism to apply pressure onto the shaft while it is rotating. This causes "stick-slip" and rapid wear of the brush surface and leads to frequent replacement.

17. Why do conventional shaft grounding brushes need maintenance?

Answer: Conventional metal or carbon brushes need frequent maintenance to ensure they are free from oil or other contaminants. Mechanical stress will cause springs to weaken.

Frequently asked questions (continued)

18. Should conventional copper shaft grounding brushes be replaced by AEGIS SGR™ on VFD motors?

Answer: AEGIS SGR™ replaces conventional shaft grounding brushes, improves reliability, and decrease maintenance costs. Conventional shaft grounding brushes need frequent maintenance and become less effective over time. They rely on the spring tension to press the brush against the rotating shaft. This causes the brush material to wear as it rubs on the shaft – sometimes as little as 3 months. Oil, grease, dirt or oxidation will break the conductive path and will reduce or prevent conventional brushes from discharging shaft currents.

19. Where do the VFD shaft currents go without a brush installed?

Answer: The shaft currents will build up on the motor shaft and discharge through the bearings. This occurs because voltages are induced onto the motor shaft and overcome the dielectric of the grease film between ball and race.

20. Will electrical bearing damage always occur in a VFD application?

Answer: Yes – without an alternate path to discharge shaft current, pitting of the motor bearing will take place during VFD operation. Discharges will continue and will always seek the path of least resistance – commonly through the motor bearings. Installing AEGIS SGR™ will create an alternate path for discharges and divert current away from the motor bearings.

21. How about VFD duty motors, are they safe from bearing damage?

Answer: Electrical bearing discharges will occur even in VFD duty motors and must be addressed to avoid potential failures. Without the AEGIS SGR™ installed, the VFD induced shaft currents will discharge through the motor bearings and may eventually cause failure.

22. How about IEEE 841 motors, are they safe from electrical bearing damage?

Answer: All motors, including the IEEE 841 and premium efficiency motors will experience electrical bearing damage when operated by VFDs – unless they are protected from shaft current. Inpro Seal's MGS bearing isolator combines the AEGIS SGR™ technology with the bearing isolator. These motors may be easily retrofitted for shaft current protection by replacing the standard Inpro Seal bearing isolator with the MGS bearing isolator.

23. We just installed VFDs on many of our motors and so far everything is OK, should I be worried about shaft current?

Answer: Yes – even if you have not experienced excess noise, vibration or bearing failure so far, the VFD induced shaft currents continuously discharge through the motor bearings during operation and may cause an unplanned failure unless there is a means to discharge them. By installing the AEGIS SGR™ Conductive MicroFibre™ shaft grounding brush, you will provide the best means of protection and prevention to avoid unplanned motor failure.

24. From a preventative maintenance perspective what would you recommend?

Answer: In order to prevent potential catastrophic failures, AEGIS SGR™ Conductive MicroFibre™ brush or the Inpro Seal MGS bearing isolator should be installed on both sides of large motors and a single AEGIS SGR™ or MGS for small motors.

25. Our AEGIS SGR™ is installed over the shaft keyway, is this a problem?

Answer: Positioning the AEGIS SGR™ over the shaft keyway is not a problem because the fibres are flexible enough to bend over the keyway and function properly.

26. What is the wear rate of the micro fibres?

Answer: The unique Conductive MicroFibres™ used in the AEGIS SGR™ are a very tough material and will not readily wear. Because of the patent pending design, there is virtually no frictional pressure to cause fibre wear as with conventional brush configurations.

27. What is the best way to measure shaft voltage?

Answer: The best measurements are taken with an oscilloscope by placing the probe in the middle of the end of the shaft – drive end or non-drive end and observing the shaft voltages.

28. Can an RMS measurement be used to test for the presence of shaft voltages?

Answer: Measuring RMS is not the best way to check for damaging shaft voltages, however it does indicate their presence. RMS “averages” the voltage reading but does not show the voltage spikes that cause the electrical bearing discharges.

29. Will the AEGIS SGR™ work in washdown duty motor?

Answer: Yes, the AEGIS SGR™ works well in wash down duty motors because the fibres are not effected by water.

30. Should one or two AEGIS SGR™s be installed on the motor?

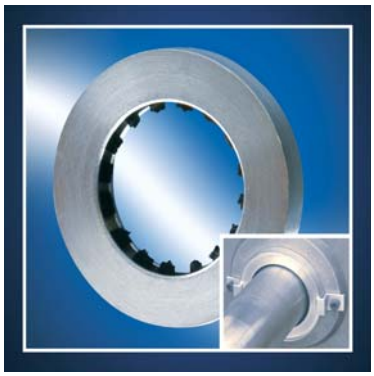
Answer: For smaller frame motors with shaft diameters of less than 50mm you will generally need a single AEGIS SGR™ on the motor. This is because circulating currents are not present in smaller motors. Any motor with larger than 50mm shaft should have an AEGIS SGR™ on both the drive end and non-drive end to discharge both VFD currents and circulating currents.

31. If AEGIS SGR™ is installed outdoors, will water affect performance?

Answer: There is no problem with water or moisture – AEGIS SGR™ will perform despite the presence of water inside AEGIS SGR™.

32. Does corrosion occur to AEGIS SGR™ with water?

Answer: Fresh water will not cause corrosion, if operated in a corrosive environment then you must specify a stainless steel AEGIS SGR™.



AEGIS SGR™ sizing chart

STOCK PARTS

Conductive MicroFibre™ motor shaft grounding brush

Catalog number	SGR part number	Minimum shaft diameter mm	Maximum shaft diameter mm	Outside diameter mm	Thickness mm	IEC	IEC shaft diameter mm	Bearing bore
SGR-6.9-2	SGR-6.9-40.6-2*A	7.9	9.0	40.6	7.1	56	9	
SGR-8.0-2	SGR-8.0-40.6-2*A	9.1	10.0	40.6	7.1		10	Y
SGR-9.0-2	SGR-9.0-40.6-2*A	10.1	11.0	40.6	7.1	63	11	
SGR-10.1-2	SGR-10.1-40.6-2*A	11.1	12.2	40.6	7.1			
SGR-11.2-2	SGR-11.2-40.6-2*A	12.3	13.2	40.6	7.1			
SGR-12.2-2	SGR-12.2-40.6-2*A	13.3	14.2	40.6	7.1	71	14	
SGR-13.2-2	SGR-13.2-40.6-2*A	14.3	15.4	40.6	7.1		15	Y
SGR-14.4-2	SGR-14.4-40.6-2*A	15.5	16.4	40.6	7.1			
SGR-15.4-2	SGR-15.4-53.3-2*A	16.5	17.4	53.3	7.1			
SGR-16.4-2	SGR-16.4-53.3-2*A	17.5	18.5	53.3	7.1			
SGR-17.6-2	SGR-17.6-53.3-2*A	18.6	19.7	53.3	7.1	80	19	
SGR-18.7-2	SGR-18.7-53.3-2*A	19.8	20.7	53.3	7.1		20	Y
SGR-19.7-2	SGR-19.7-53.3-2*A	20.8	21.7	53.3	7.1			
SGR-20.7-2	SGR-20.7-53.3-2*A	21.8	22.7	53.3	7.1			
SGR-21.7-2	SGR-21.7-53.3-2*A	22.8	23.7	53.3	7.1			
SGR-22.8-2	SGR-22.8-53.3-2*A	23.8	24.9	53.3	7.1	90S, 90L	24	
SGR-23.9-2	SGR-23.9-53.3-2*A	25.0	25.9	53.3	7.1		25	Y
SGR-24.9-2	SGR-24.9-53.3-2*A	26.0	26.9	53.3	7.1			
SGR-25.9-2	SGR-25.9-53.3-2*A	27.0	28.1	53.3	7.1	100L, 112S, 112M	28	
SGR-27.1-2	SGR-27.1-53.3-2*A	28.2	29.1	53.3	7.1			
SGR-28.1-2	SGR-28.1-53.3-2*A	29.2	30.1	53.3	7.1		30	Y
SGR-29.1-2	SGR-29.1-53.3-2*A	30.2	31.2	53.3	7.1			
SGR-30.3-2	SGR-30.3-53.3-2*A	31.3	32.3	53.3	7.1			
SGR-31.3-2	SGR-31.3-53.3-2*A	32.4	33.3	53.3	7.1			
SGR-32.3-2	SGR-32.3-53.3-2*A	33.4	34.4	53.3	7.1			
SGR-33.4-2	SGR-33.4-53.3-2*A	34.5	35.4	53.3	7.1		35	Y
SGR-34.4-2	SGR-34.4-68.1-2*A	35.5	36.4	68.1	6.6			
SGR-35.5-2	SGR-35.5-68.1-2*A	36.5	37.6	68.1	6.6			
SGR-36.6-2	SGR-36.6-68.1-2*A	37.7	38.6	68.1	6.6	132S, 132M	38	
SGR-37.6-2	SGR-37.6-68.1-2*A	38.7	39.6	68.1	6.6			
SGR-38.6-2	SGR-38.6-68.1-2*A	39.7	40.8	68.1	6.6		40	Y
SGR-39.8-2	SGR-39.8-68.1-2*A	40.9	41.8	68.1	6.6			
SGR-40.8-2	SGR-40.8-68.1-2*A	41.9	42.8	68.1	6.6	160M*, 160L*	42	
SGR-41.8-2	SGR-41.8-68.1-2*A	42.9	43.9	68.1	6.6			

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Catalog number	SGR part number	Minimum shaft diameter mm	Maximum shaft diameter mm	Outside diameter mm	Thickness mm	IEC	IEC shaft diameter mm	Bearing bore
SGR-43.0-2	SGR-43.0-68.1-2*A	44.0	45.0	68.1	6.6		45	Y
SGR-44.0-2	SGR-44.0-68.1-2*A	45.1	46.0	68.1	6.6			
SGR-45.0-2	SGR-45.0-68.1-2*A	46.1	47.1	68.1	6.6			
SGR-46.1-2	SGR-46.1-68.1-2*A	47.2	48.1	68.1	6.6	180M*, 180L*	48	
SGR-47.1-2	SGR-47.1-68.1-2*A	48.2	49.1	68.1	6.6			
SGR-48.2-2	SGR-48.2-68.1-2*A	49.2	50.3	68.1	6.6		50	Y
SGR-49.3-2	SGR-49.3-68.1-2*A	50.4	51.3	68.1	6.6			
SGR-50.3-2	SGR-50.3-78.8-2*A	51.4	52.3	78.8	7.1			
SGR-51.3-2	SGR-51.3-78.8-2*A	52.4	53.5	78.8	7.1			
SGR-52.5-2	SGR-52.5-78.8-2*A	53.6	54.5	78.8	7.1			
SGR-53.5-2	SGR-53.5-78.8-2*A	54.6	55.5	78.8	7.1	200M*, 200L*	55	
SGR-54.5-2	SGR-54.5-78.8-2*A	55.6	56.6	78.8	7.1			
SGR-55.7-2	SGR-55.7-78.8-2*A	56.7	57.7	78.8	7.1			
SGR-56.7-2	SGR-56.7-78.8-2*A	57.8	58.7	78.8	7.1			
SGR-57.7-2	SGR-57.7-78.8-2*A	58.8	59.8	78.8	7.1			
SGR-58.8-2	SGR-58.8-78.8-2*A	59.9	60.8	78.8	7.1	225S*, 225M*	60	
SGR-59.8-2	SGR-59.8-91.4-2*A	60.9	61.8	91.4	7.1			
SGR-60.9-2	SGR-60.9-91.4-2*A	61.9	63.0	91.4	7.1			
SGR-62.0-2	SGR-62.0-91.4-2*A	63.1	64.0	91.4	7.1			
SGR-63.0-2	SGR-63.0-91.4-2*A	64.1	65.0	91.4	7.1	250M*	65	
SGR-64.0-2	SGR-64.0-91.4-2*A	65.1	66.2	91.4	7.1			
SGR-65.2-2	SGR-65.2-91.4-2*A	66.3	67.2	91.4	7.1			
SGR-66.2-2	SGR-66.2-91.4-2*A	67.3	68.2	91.4	7.1			
SGR-67.2-2	SGR-67.2-91.4-2*A	68.3	69.3	91.4	7.1			
SGR-68.4-2	SGR-68.4-91.4-2*A	69.4	70.4	91.4	7.1		70	Y
SGR-69.4-2	SGR-69.4-91.4-2*A	70.5	71.4	91.4	7.1			
SGR-70.4-2	SGR-70.4-91.4-2*A	71.5	72.5	91.4	7.1			
SGR-71.5-2	SGR-71.5-91.4-2*A	72.6	73.5	91.4	7.1			
SGR-72.5-2	SGR-72.5-104.1-2*A	73.6	74.5	104.1	7.1			
SGR-73.6-2	SGR-73.6-104.1-2*A	74.6	75.7	104.1	7.1	280S*, 280M*	75	
SGR-74.7-2	SGR-74.7-104.1-2*A	75.8	76.7	104.1	7.1			
SGR-75.7-2	SGR-75.7-104.1-2*A	76.8	77.7	104.1	7.1			
SGR-76.7-2	SGR-76.7-104.1-2*A	77.8	78.9	104.1	7.1			
SGR-77.9-2	SGR-77.9-104.1-2*A	79.0	79.9	104.1	7.1			

AEGIS SGR™ sizing chart stock parts (continued)

Conductive MicroFibre™ motor shaft grounding brush

Catalog number	SGR part number	Minimum shaft diameter mm	Maximum shaft diameter mm	Outside diameter mm	Thickness mm	IEC	IEC shaft diameter mm	Bearing bore
SGR-78.9-2	SGR-78.9-104.1-2*A	80.0	80.9	104.1	7.1		80	Y
SGR-79.9-2	SGR-79.9-104.1-2*A	81.0	82.0	104.1	7.1			
SGR-81.1-2	SGR-81.1-104.1-2*A	82.1	83.1	104.1	7.1			
SGR-82.1-2	SGR-82.1-104.1-2*A	83.2	84.1	104.1	7.1			
SGR-83.1-2	SGR-83.1-104.1-2*A	84.2	85.2	104.1	7.1		85	Y
SGR-84.2-2	SGR-84.2-104.1-2*A	85.3	86.2	104.1	7.1			
SGR-85.2-2	SGR-85.2-116.8-2*A	86.3	87.2	116.8	7.1			
SGR-86.3-2	SGR-86.3-116.8-2*A	87.3	88.4	116.8	7.1			
SGR-87.4-2	SGR-87.4-116.8-2*A	88.5	89.4	116.8	7.1			
SGR-88.4-2	SGR-88.4-116.8-2*A	89.5	90.4	116.8	7.1		90	Y
SGR-89.4-2	SGR-89.4-116.8-2*A	90.5	91.6	116.8	7.1			
SGR-90.6-2	SGR-90.6-116.8-2*A	91.7	92.6	116.8	7.1			
SGR-91.6-2	SGR-91.6-116.8-2*A	92.7	93.6	116.8	7.1			
SGR-92.6-2	SGR-92.6-116.8-2*A	93.7	94.7	116.8	7.1			
SGR-93.8-2	SGR-93.8-116.8-2*A	94.8	95.8	116.8	7.1		95	Y
SGR-94.8-2	SGR-94.8-116.8-2*A	95.9	96.8	116.8	7.1			
SGR-95.8-2	SGR-95.8-116.8-2*A	96.9	97.9	116.8	7.1			
SGR-96.9-2	SGR-96.9-116.8-2*A	98.0	98.9	116.8	7.1			
SGR-97.9-2	SGR-97.9-129.5-2*A	99.0	99.9	129.5	7.1			
SGR-99.0-2	SGR-99.0-129.5-2*A	100.0	101.1	129.5	7.1		100	Y
SGR-100.1-2	SGR-100.1-129.5-2*A	101.2	102.1	129.5	7.1			
SGR-101.1-2	SGR-101.1-129.5-2*A	102.2	103.1	129.5	7.1			
SGR-102.1-2	SGR-102.1-129.5-2*A	103.2	104.3	129.5	7.1			
SGR-103.3-2	SGR-103.3-129.5-2*A	104.4	105.3	129.5	7.1		105	Y
SGR-104.3-2	SGR-104.3-129.5-2*A	105.4	106.3	129.5	7.1			
SGR-105.3-2	SGR-105.3-129.5-2*A	106.4	107.4	129.5	7.1			
SGR-106.5-2	SGR-106.5-129.5-2*A	107.5	108.5	129.5	7.1			
SGR-107.5-2	SGR-107.5-129.5-2*A	108.6	109.5	129.5	7.1			
SGR-108.5-2	SGR-108.5-129.5-2*A	109.6	110.6	129.5	7.1		110	Y
SGR-109.6-2	SGR-109.6-129.5-2*A	110.7	111.6	129.5	7.1			
SGR-110.6-2	SGR-110.6-142.2-2*A	111.7	112.6	142.2	7.1			
SGR-111.7-2	SGR-111.7-142.2-2*A	112.7	113.8	142.2	7.1			
SGR-112.8-2	SGR-112.8-142.2-2*A	113.9	114.8	142.2	7.1			
SGR-113.8-2	SGR-113.8-142.2-2*A	114.9	115.8	142.2	7.1		115	Y
SGR-114.8-2	SGR-114.8-142.2-2*A	115.9	117.0	142.2	7.1			

Catalog number	SGR part number	Minimum shaft diameter mm	Maximum shaft diameter mm	Outside diameter mm	Thickness mm	IEC	IEC shaft diameter mm	Bearing bore
SGR-116.0-2	SGR-116.0-142.2-2*A	117.1	118.0	142.2	7.1			
SGR-117.0-2	SGR-117.0-142.2-2*A	118.1	119.0	142.2	7.1			
SGR-118.0-2	SGR-118.0-142.2-2*A	119.1	120.1	142.2	7.1		120	Y
SGR-119.2-2	SGR-119.2-142.2-2*A	120.2	121.2	142.2	7.1			
SGR-120.2-2	SGR-120.2-142.2-2*A	121.3	122.2	142.2	7.1			
SGR-121.2-2	SGR-121.2-142.2-2*A	122.3	123.3	142.2	7.1			
SGR-122.3-2	SGR-122.3-142.2-2*A	123.4	124.3	142.2	7.1			
SGR-123.3-2	SGR-123.3-154.9-2*A	124.4	125.3	154.9	7.1			
SGR-124.4-2	SGR-124.4-154.9-2*A	125.4	126.5	154.9	7.1		125	Y
SGR-125.5-2	SGR-125.5-154.9-2*A	126.6	127.5	154.9	7.1			
SGR-126.5-2	SGR-126.5-154.9-2*A	127.6	128.5	154.9	7.1			
SGR-127.5-2	SGR-127.5-154.9-2*A	128.6	129.7	154.9	7.1			
SGR-128.7-2	SGR-128.7-154.9-2*A	129.8	130.7	154.9	7.1		130	Y
SGR-129.7-2	SGR-129.7-154.9-2*A	130.8	131.7	154.9	7.1			
SGR-130.7-2	SGR-130.7-154.9-2*A	131.8	132.8	154.9	7.1			
SGR-131.9-2	SGR-131.9-154.9-2*A	132.9	133.9	154.9	7.1			
SGR-132.9-2	SGR-132.9-154.9-2*A	134.0	134.9	154.9	7.1			
SGR-133.9-2	SGR-133.9-154.9-2*A	135.0	136.0	154.9	7.1		135	Y
SGR-135.0-2	SGR-135.0-154.9-2*A	136.1	137.0	154.9	7.1			
SGR-136.0-2	SGR-136.0-167.6-2*A	137.1	138.0	167.6	7.1			
SGR-137.1-2	SGR-137.1-167.6-2*A	138.1	139.2	167.6	7.1			
SGR-138.2-2	SGR-138.2-167.6-2*A	139.3	140.2	167.6	7.1		140	Y
SGR-139.2-2	SGR-139.2-167.6-2*A	140.3	141.2	167.6	7.1			
SGR-140.2-2	SGR-140.2-167.6-2*A	141.3	142.4	167.6	7.1			
SGR-141.4-2	SGR-141.4-167.6-2*A	142.5	143.4	167.6	7.1			
SGR-142.4-2	SGR-142.4-167.6-2*A	143.5	144.4	167.6	7.1			
SGR-143.4-2	SGR-143.4-167.6-2*A	144.5	145.5	167.6	7.1		145	Y
SGR-144.6-2	SGR-144.6-167.6-2*A	145.6	146.6	167.6	7.1			
SGR-145.6-2	SGR-145.6-167.6-2*A	146.7	147.6	167.6	7.1			
SGR-146.6-2	SGR-146.6-167.6-2*A	147.7	148.7	167.6	7.1			
SGR-147.7-2	SGR-147.7-167.6-2*A	148.8	149.7	167.6	7.1			
SGR-148.7-2	SGR-148.7-180.3-2*A	149.8	150.7	180.3	7.1		150	Y
SGR-149.8-2	SGR-149.8-180.3-2*A	150.8	151.9	180.3	7.1			
SGR-150.9-2	SGR-150.9-180.3-2*A	152.0	152.9	180.3	7.1			

**Patents pending*

- *All prices are subject to change without notice*
- ***Special order parts:*** *Call for estimated ship date*
- ***Stock parts:*** *Usually ship same or next business day*
- ***Shipping term:*** *Ex-works, Revesby NSW*

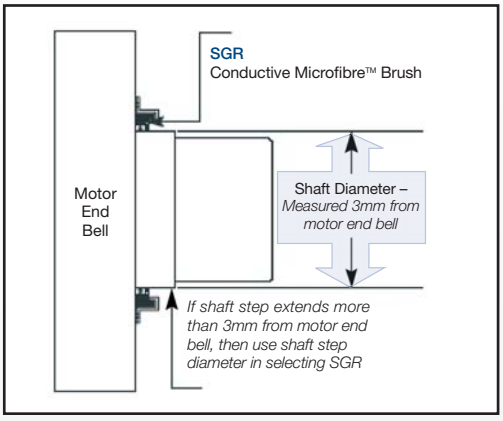
Selecting the right size

AEGIS SGR™ FOR YOUR MOTOR

Step 1: Measure shaft diameter at a point 3 mm from motor end bell.

Step 2: To select the correct AEGIS SGR™ part number, refer to the AEGIS SGR™ size chart provided.

Note: many motors have a step in the shaft before the usable portion directly after the motor end bell.



Example shaft measurement 125.8mm

Shaft Diameters 124.4 mm - 154.9 mm (SGR size chart)

SGR Part Number	Minimum Shaft Diameter mm	Maximum Shaft Diameter mm	Outside Diameter mm	Thickness mm
SGR-123.3-154.9-2*A	124.4	125.3	154.9	7.1
SGR-124.4-154.9-2*A	125.4	126.5	154.9	7.1
SGR-125.5-154.9-2*A	126.6	127.5	154.9	7.1

Notes:

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