

# Advanced Products Aegis® SGR



## Morgan Advanced Materials

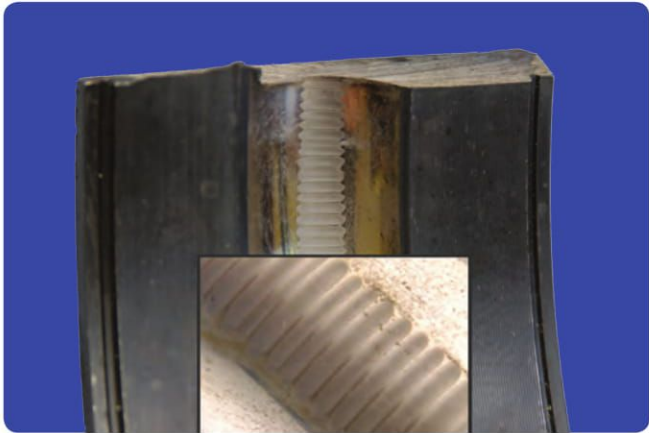
**Morgan Advanced Materials is a global materials engineering company which designs and manufactures a wide range of high specification products with extraordinary properties, across multiple sectors and geographies.**

**From an extensive range of advanced materials we produce components, assemblies and systems that deliver significantly enhanced performance for our customers' products and processes. Our engineered solutions are produced to very high tolerances and many are designed for use in extreme environments.**

**The Company thrives on breakthrough innovation. Our materials scientists and applications engineers work in close collaboration with customers to create outstanding, highly differentiated products that perform more efficiently, more reliably and for longer. Morgan Advanced Materials has a global presence with more than 10,000 employees across 50 countries serving specialist markets in the energy, transport, healthcare, electronics, security and defence, petrochemical and industrial sectors. It is listed on the London Stock Exchange in the engineering sector (ticker **MGAM**).**

MORGAN ADVANCED MATERIALS  
manufacturing locations

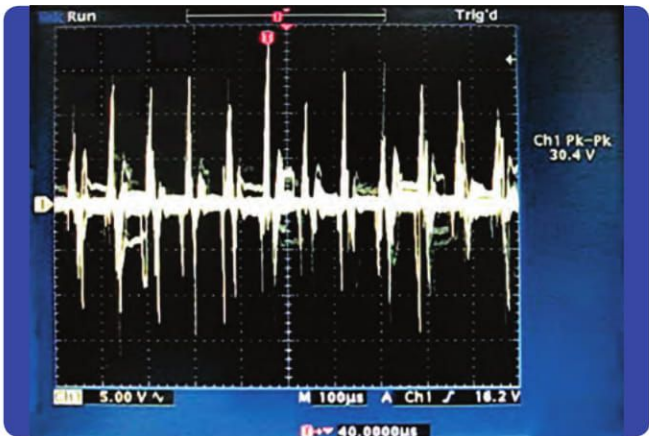




**Don't let this happen to your bearings!**

**Sustainable Motor Design - Prevent Bearing Failure**

AEGIS® Bearing Protection Ring- protects motor bearings for life. Variable frequency drives (VFD) induce electrical voltages onto the shaft of AC and DC motors. With AEGIS® SGR Bearing Protection Ring installed on the motor, you benefit from sustainability, system up-time, production improvement, and higher reliability.



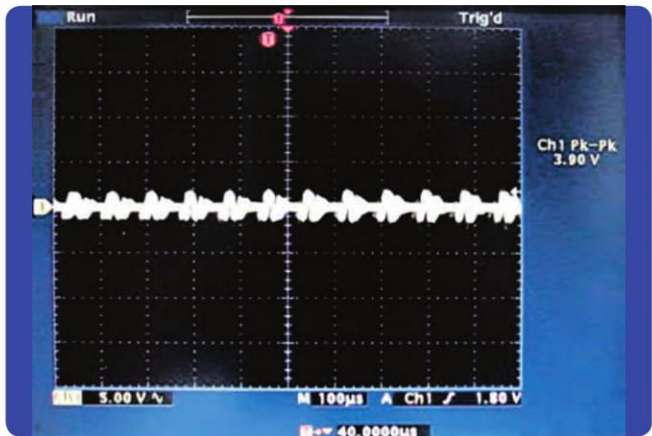
Shaft voltage reading with no protection

**PROBLEM: VFD Induced Shaft Voltages Damage Bearings**

(VFD) on AC and DC motors induce harmful electrical voltages on the motor shaft. Once these voltages exceed the resistance of the bearing lubricant, they discharge through the motor's bearings causing fusion craters, severe pitting, fluting damage, excessive bearing noise and eventually bearing failure.

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Shaft voltage reading with AEGIS® SGR

**AEGIS® SGR - Electrical Bearing Damage Protection**

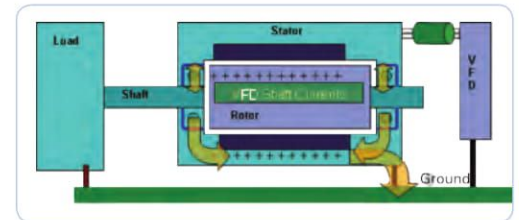
The new AEGIS® SGR Bearing Protection Ring prevents electrical bearing damage by safely channelling harmful shaft voltages away from the bearings to ground. Using proprietary Electron Transport Technology™, the conductive micro fibres inside the AEGIS® SGR provide the path of least resistance and dramatically extend motor life.



# About Shaft Voltages and Bearing Currents

## VFD Induced Shaft Voltages - All Motors

Damaging voltages are induced on the shafts of AC and DC motors controlled by variable frequency drives (VFD). The extremely high on/off switching speeds of the pulse width modulation (PWM), generated by the insulated gate bipolar transistors (IGBT), induce damaging voltages onto the motor shaft through parasitic capacitive coupling between the stator and rotor. This common mode shaft voltage seeks a path to ground, usually through the motor's bearings.



EDM Currents Damage Bearings

## Electrical Damage in the Bearings (EDM) - Pitting, Fluting, Failure

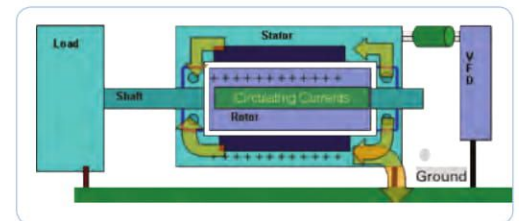
Damaging currents arc through the dielectric oil film between the rolling elements and the bearing race. This is known as electrical discharge machining (EDM) effect. EDM causes fusion craters, severe pitting, and eventually bearing fluting (a washboard-like pattern in the bearing race) which results in premature bearing failure.



Bearing fluting, "washboard" pattern on bearing race

## High Frequency Circulating Currents in Large AC and DC Motors

In addition to potential bearing failures in motors from VFD induced EDM currents, AC and DC motors above 75kW may also experience bearing failures caused by high frequency circulating currents. VFD induced high frequency circulating currents are in the kilohertz or even megahertz range and circulate through the motor's bearings because of magnetic flux imbalances in the stator. This type of VFD induced current becomes the more dominant destructive current in higher kW motors.



High Frequency Currents Damage Bearings

## Technology Comparison

	AEGIS® SGR	Insulating sleeve	Ceramic/Hybrid Bearing	Copper or Bronze Metal Brush	Carbon Block Brush	Conductive Grease
Protects Motor and Attached Equipment	Yes	No	No	No	No	No
Long-term Effectiveness	Yes	No	No	No	No	No
Easy to install	Yes	No	No	No	No	No
Low Lifetime Cost High return on Investment	Yes	No	No	No	No	No
Effective at any RPM	Yes	Yes	Yes	No	No	No
Maintenance Free Operation	Yes	Yes	Yes	No	No	No

AEGIS® SGR Bearing Protection Ring is the most effective solution to protect bearings in motors and attached equipment from EDM currents and VFD induced shaft voltages.



# Application Notes for AEGIS® Bearing Protection Ring

## Improve System Reliability and Production with Sustainable Motor Design

### Motors up to 75kW

Any motor controlled by a variable frequency drive (VFD) requires bearing protection. Motors of 75kW down to fractional kW motors will experience bearing failures when operated on a PWM drive. AEGIS® SGR Bearing Protection Ring guarantees that bearings will not fail in these motors from fluting damage for the service life of the motor.

Install one AEGIS® SGR Bearing Protection Ring on either the drive end or the non-drive end of the motor. The simplest installation is to slide the AEGIS® SGR over the drive end and fasten it to the motor end bell with the easy to install mounting hardware included with each AEGIS® SGR.

Recommend Colloidal Silver Shaft Coating PN CS015

### Motors 75kW to 750kW

Large motors above 75kW may have VFD induced EDM currents as well as high frequency circulating currents when they are controlled by VFDs. To protect the bearings, insulate the bearing on one end and install an AEGIS® SGR on the other end.

### Insulation on one end (usually NDE) and AEGIS® SGR on opposite end

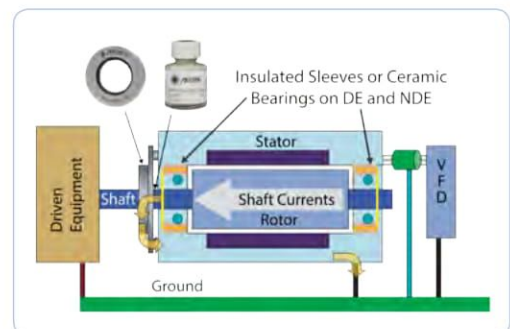
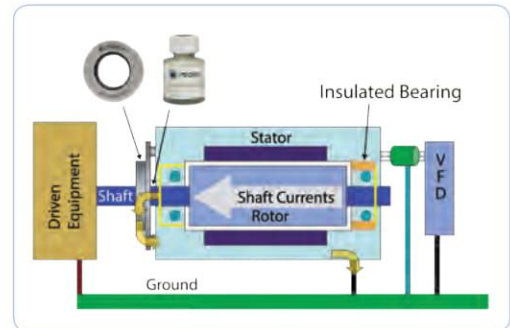
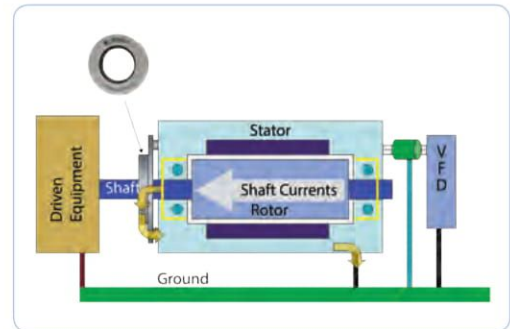
- Motor frame must be well grounded
- Non-Drive End: Bearing journal should be insulated or Insulated/Ceramic Bearing installed to disrupt circulating currents
- Install AEGIS® SGR Bearing Protection Ring on opposite end of insulation and Insulated/Ceramic Bearing (usually DE)
- Protects bearings in attached equipment (gear box, pillow block, encoder etc.)

Recommend Colloidal Silver Shaft Coating PN CS015

### Critical Applications: Insulate both ends and add the AEGIS® SGR Bearing Protection Ring

- Motor frame must be well grounded
- Drive and Non-Drive end: Bearing journals should be insulated or insulated/ceramic bearing installed to disrupt circulating currents
- Install AEGIS® SGR Bearing Protection Ring on drive or non-drive end to provide path of least resistance for shaft voltages and to channel VFD induced currents to ground.
- AEGIS® SGR required to protect bearings in attached equipment (gear box, pillow block, encoder, etc.)

Coat shaft with AEGIS® Colloidal Silver Shaft Coating



# AEGIS® iPRO Bearing Protection Ring



## High Current Bearing Protection

- Medium Voltage Motors
- Large Motors and Generators over 750kW
- Power Generators over 750kW

Large motors and generators often have much higher induced shaft voltages and bearing currents which require a high current capable Bearing Protection Ring. High frequency circulating currents induced by variable frequency drives (VFD) will cause bearing fluting and catastrophic failure in these motors. Generators experience current surges which can cause electrical arcing in bearings and equipment.

### Features:

- 6 rows conductive microfiber
- High current capable
- AEGIS® iPRO shaft current monitoring compatible
- Long term reliable performance
- Available in sizes up to 30" (762mm) shaft diameter

### Application:

- One end of the motor should be insulated. Install AEGIS® iPRO on opposite end of insulation to protect the non-insulated bearing.
- Coat shaft with AEGIS® Colloidal Silver Shaft Coating (ships with iPRO)

**Purpose of Application Notes:** Application notes are intended as general guidance to assist with proper application. All statements and technical information are rendered in good faith. User must assume responsibility to determine suitability of the product for its intended use.

## Bearing Protection Facts:

### Bearing protection for motors and attached equipment:

Only AEGIS® SGR will protect both motor bearings and the bearings in attached equipment. VFD induced currents on the shaft can discharge through motor bearings or coupled equipment like gear boxes, pumps, fan bearings, pillow blocks, encoders, brake motors, etc. AEGIS® SGR addresses the root of the problem and channels harmful currents to ground.

### Maintenance free bearing protection for life:

Hundreds of thousands of conductive micro fibers have virtually zero wear during operation, even at high RPM and high surface rates. Unlike carbon block brushes, there is no spring pressure on fibers. AEGIS® SGR Bearing Protection Ring will last for the service life of the motor.

### AEGIS® SGR is effective in grease, oil, dirt or dust:

Lab and field tested. The conductive micro fibers "sweep" away contaminants from the shaft surface and maintain a conductive path even when oil, grease, dirt or dust get on the shaft.

### Operation in harsh environments where fibers are exposed to excessive debris:

To prevent particles from damaging the fibers, install a slinger or O-ring against the AEGIS® SGR.

### Colloidal Silver Shaft Coating\*:

#### NEW TECHNOLOGY

Improving the conductivity of the steel shaft surface enhances the shaft voltage discharge capability in AEGIS® shaft grounding applications. Maintaining a highly conductive shaft surface is especially important in critical applications or in applications where the conductive shaft surface of steel could become compromised. Environmental elements could create a potential for decreased conductivity on the shaft of the motor.

\*Recommended for all AEGIS® SGR installations.



### AEGIS® SGR Bearing Protection Ring current handling capability:

AEGIS® SGR is rated to discharge high frequency current. Variable frequency drives (VFD) induce high frequency EDM currents of up to 2 amps in 50 billionths of a second. AEGIS® SGR protects the bearing by safely channelling the energy away from the motor bearings to ground.

### AEGIS® Bearing Protection Ring - the most reliable bearing protection:

Production up-time and reliability improve when AEGIS® SGR is installed. The patented ring of hundreds of thousands of conductive micro fibres provide protection for the service life of the motor. The fibres will always surround the shaft with a conductive path for destructive shaft currents while the motor is running.

### Vertical Motors:

Insulate top bearing or shaft with non conductive coating. For bottom bearing, coat shaft with Colloidal Silver Shaft Coating and install AEGIS® Bearing Protection Ring.

### Motors with Ceramic Bearings

Insulating both bearing journals or using ceramic coated bearings in the motor does not prevent VFD induced currents from discharging through the bearings on attached equipment and may present a voltage hazard. Whenever ceramic bearings are used in a motor, AEGIS® SGR is required to protect attached equipment and reduce potentially dangerous shaft voltages.



# Selecting the right size Bearing Protection Ring for your motor

## Mounting Options shown on page 8

1. Measure shaft diameter at a point 3mm from motor end bell.
2. Refer to the part lists to locate the correct SGR part number.

Note: If you have a slinger or a shaft shoulder that is less than 9.5mm, you will need the IEC kit. See page 13 for more information.

Example shaft measurement 10.8mm*				
Catalogue Number	Min. Shaft Diameter	Max. Shaft Diameter	Outside Diameter	Thickness Max.
SGR-6.9-2	7.9	9.0	40.6	7.5
SGR-8.0-2	9.0	10.0	40.6	7.5
SGR-9.0-2	10.1	*11.0	40.6	7.5
SGR-10.1-2	11.1	12.2	40.6	7.5
SGR-11.2-2	12.2	13.2	40.6	7.5

## Shaft Shoulder:

The standard SGR can be mounted to the shaft shoulder but the shoulder should be at least 9.5mm in length so that all of the fibers are in contact with the rotating shaft. Measure the diameter of the shaft shoulder then locate the correct SGR on the part lists.

## Custom Option for Short Shaft Shoulders:

If the shaft shoulder is between 4.7mm and 9.5mm we offer a custom part. For this option, we place the fibers closer to the back of the ring to allow for fiber contact on a shorter shoulder. To order this option, add an "X" or "AX" to the suffix of the part.

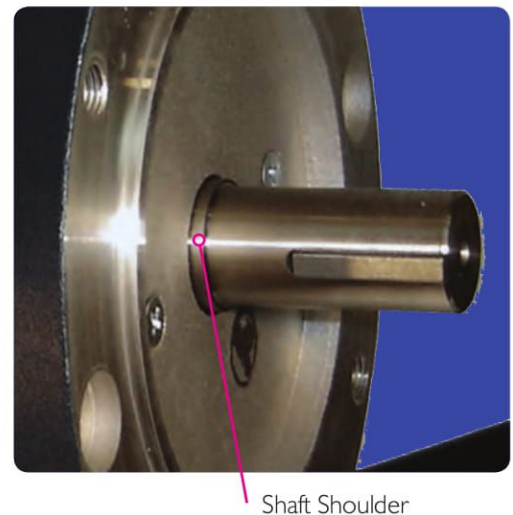
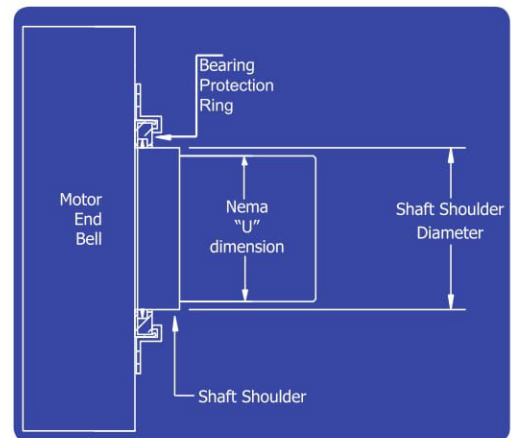
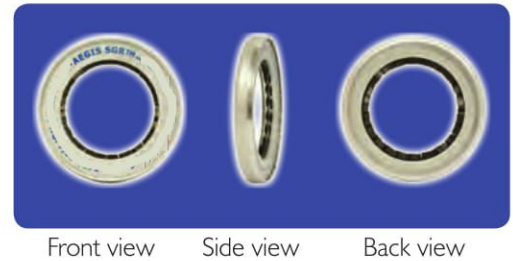
## Example:

### Standard SGR

PN: SGR-6.9-0A4W  
 PN: SGR-6.9-0AW  
 PN: SGR-6.9-2  
 PN: SGR-6.9-2A4  
 PN: SGR-6.9-3

### Short Shoulder SGR

PN: SGR-6.9-0A4WX  
 PN: SGR-6.9-0AWX  
 PN: SGR-6.9-2AX  
 PN: SGR-6.9-2A4X  
 PN: SGR-6.9-3AX





# AEGIS® SGR Bearing Protection Ring Options

## AEGIS® SGR uKIT with Universal Mounting Bracket

Sized for IEC Frame motors

Solid and Split Ring

Can be mounted with hardware or conductive epoxy



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## Conductive Epoxy Mounting

Shaft diameters: 7.9mm to 152.9mm

Solid and Split Ring

Quick and easy installation to metal motor frame

Conductive Epoxy Included



Page 8

## Standard Mounting Brackets

Shaft diameters: 7.9mm to 152.9mm. For bigger shaft diameters please contact our customer service.

Ships with mounting brackets, M3 screws and washers

Quick and easy installation to most surfaces



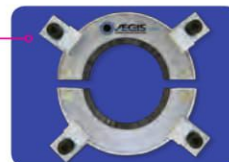
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## Split Ring

Shaft diameter: 7.9mm to 152.9mm. For bigger shaft diameters please contact our customer service.

4 to 6 mounting brackets, M3 screws and washers

Installs without decoupling motor



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## Bolt Through Mounting

Shaft diameters: 7.9mm to 152.9mm. For bigger shaft diameters please contact our customer service.

M3 x 14 socket head cap screws and lock washers

2 mounting holes up to shaft size 98.9mm

4 mounting holes for larger sizes



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## Press Fit Mounting

Shaft diameters: 7.9mm to 152.9mm

Clean dry 0.1mm press fit

Custom sizes available



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## IEC Mounting Kits

Shaft diameter: see chart for standard kits

Custom kits available for other shaft diameters

Clears any slinger, shaft shoulder or protrusion



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## AEGIS® Accessories

SVP - AEGIS® Shaft Voltage Probe

CS015 - AEGIS® Colloidal Silver Shaft Coating

EP2400 - AEGIS® Conductive Epoxy



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# AEGIS® SGR - Conductive Epoxy Mounting



Dimensions in mm

## AEGIS® SGR and Conductive Epoxy Included

To purchase Conductive Epoxy only, use Catalog Number EP2400

Solid SGR Catalog Number	Split SGR* Catalog Number	Min.shaft diameter	Max.shaft diameter	Outside diameter	Thickness Max
SGR-6.9-0AW	SGR-6.9-0A4W	7.9	9.0	40.6	7.5
SGR-8.0-0AW	SGR-8.0-0A4W	9.1	10.0	40.6	7.5
SGR-9.0-0AW	SGR-9.0-0A4W	10.1	11.0	40.6	7.5
SGR-10.1-0AW	SGR-10.1-0A4W	11.1	12.2	40.6	7.5
SGR-11.2-0AW	SGR-11.2-0A4W	12.3	13.2	40.6	7.5
SGR-12.2-0AW	SGR-12.2-0A4W	13.3	14.2	40.6	7.5
SGR-13.2-0AW	SGR-13.2-0A4W	14.3	15.4	40.6	7.5
SGR-14.4-0AW	SGR-14.4-0A4W	15.5	16.4	40.6	7.5
SGR-15.4-0AW	SGR-15.4-0A4W	16.5	17.4	53.3	7.5
SGR-16.4-0AW	SGR-16.4-0A4W	17.5	18.5	53.3	7.5
SGR-17.6-0AW	SGR-17.6-0A4W	18.6	19.7	53.3	7.5
SGR-18.7-0AW	SGR-18.7-0A4W	19.8	20.7	53.3	7.5
SGR-19.7-0AW	SGR-19.7-0A4W	20.8	21.7	53.3	7.5
SGR-20.7-0AW	SGR-20.7-0A4W	21.8	22.7	53.3	7.5
SGR-21.7-0AW	SGR-21.7-0A4W	22.8	23.7	53.3	7.5
SGR-22.8-0AW	SGR-22.8-0A4W	23.8	24.9	53.3	7.5
SGR-23.9-0AW	SGR-23.9-0A4W	25.0	25.9	53.3	7.5
SGR-24.9-0AW	SGR-24.9-0A4W	26.0	26.9	53.3	7.5
SGR-25.9-0AW	SGR-25.9-0A4W	27.0	28.1	53.3	7.5
SGR-27.1-0AW	SGR-27.1-0A4W	28.2	29.1	53.3	7.5
SGR-28.1-0AW	SGR-28.1-0A4W	29.2	30.1	53.3	7.5
SGR-29.1-0AW	SGR-29.1-0A4W	30.2	31.2	53.3	7.5
SGR-30.3-0AW	SGR-30.3-0A4W	31.3	32.3	53.3	7.5
SGR-31.3-0AW	SGR-31.3-0A4W	32.4	33.3	53.3	7.5
SGR-32.3-0AW	SGR-32.3-0A4W	33.4	34.4	53.3	7.5
SGR-33.4-0AW	SGR-33.4-0A4W	34.5	35.4	53.3	7.5
SGR-34.4-0AW	SGR-34.4-0A4W	35.5	36.4	68.1	7.5
SGR-35.5-0AW	SGR-35.5-0A4W	36.5	37.6	68.1	7.5
SGR-36.6-0AW	SGR-36.6-0A4W	37.7	38.6	68.1	7.5
SGR-37.6-0AW	SGR-37.6-0A4W	38.7	39.6	68.1	7.5
SGR-38.6-0AW	SGR-38.6-0A4W	39.7	40.8	68.1	7.5
SGR-39.8-0AW	SGR-39.8-0A4W	40.9	41.8	68.1	7.5
SGR-40.8-0AW	SGR-40.8-0A4W	41.9	42.8	68.1	7.5
SGR-41.8-0AW	SGR-41.8-0A4W	42.9	43.9	68.1	7.5
SGR-43.0-0AW	SGR-43.0-0A4W	44.0	45.0	68.1	7.5
SGR-44.0-0AW	SGR-44.0-0A4W	45.1	46.0	68.1	7.5
SGR-45.0-0AW	SGR-45.0-0A4W	46.1	47.1	68.1	7.5
SGR-46.1-0AW	SGR-46.1-0A4W	47.2	48.1	68.1	7.5
SGR-47.1-0AW	SGR-47.1-0A4W	48.2	49.1	68.1	7.5
SGR-48.2-0AW	SGR-48.2-0A4W	49.2	50.3	68.1	7.5
SGR-49.3-0AW	SGR-49.3-0A4W	50.4	51.3	68.1	7.5
SGR-50.3-0AW	SGR-50.3-0A4W	51.4	52.3	78.7	7.5
SGR-51.3-0AW	SGR-51.3-0A4W	52.4	53.5	78.7	7.5
SGR-52.5-0AW	SGR-52.5-0A4W	53.6	54.5	78.7	7.5
SGR-53.5-0AW	SGR-53.5-0A4W	54.6	55.5	78.7	7.5
SGR-54.5-0AW	SGR-54.5-0A4W	55.6	56.6	78.7	7.5
SGR-55.7-0AW	SGR-55.7-0A4W	56.7	57.7	78.7	7.5
SGR-56.7-0AW	SGR-56.7-0A4W	57.8	58.7	78.7	7.5
SGR-57.7-0AW	SGR-57.7-0A4W	58.8	59.8	78.7	7.5
SGR-58.8-0AW	SGR-58.8-0A4W	59.9	60.8	78.7	7.5
SGR-59.8-0AW	SGR-59.8-0A4W	60.9	61.8	91.4	7.5
SGR-60.9-0AW	SGR-60.9-0A4W	61.9	63.0	91.4	7.5
SGR-62.0-0AW	SGR-62.0-0A4W	63.1	64.0	91.4	7.5
SGR-63.0-0AW	SGR-63.0-0A4W	64.1	65.0	91.4	7.5
SGR-64.0-0AW	SGR-64.0-0A4W	65.1	66.2	91.4	7.5
SGR-65.2-0AW	SGR-65.2-0A4W	66.3	67.2	91.4	7.5
SGR-66.2-0AW	SGR-66.2-0A4W	67.3	68.2	91.4	7.5
SGR-67.2-0AW	SGR-67.2-0A4W	68.3	69.3	91.4	7.5
SGR-68.4-0AW	SGR-68.4-0A4W	69.4	70.4	91.4	7.5
SGR-69.4-0AW	SGR-69.4-0A4W	70.5	71.4	91.4	7.5
SGR-70.4-0AW	SGR-70.4-0A4W	71.5	72.5	91.4	7.5
SGR-71.5-0AW	SGR-71.5-0A4W	72.6	73.5	91.4	7.5
SGR-72.5-0AW	SGR-72.5-0A4W	73.6	74.5	104.1	7.5
SGR-73.6-0AW	SGR-73.6-0A4W	74.6	75.7	104.1	7.5
SGR-74.7-0AW	SGR-74.7-0A4W	75.8	76.7	104.1	7.5
SGR-75.7-0AW	SGR-75.7-0A4W	76.8	77.7	104.1	7.5
SGR-76.7-0AW	SGR-76.7-0A4W	77.8	78.9	104.1	7.5
SGR-77.9-0AW	SGR-77.9-0A4W	79.0	79.9	104.1	7.5
SGR-78.9-0AW	SGR-78.9-0A4W	80.0	80.9	104.1	7.5
SGR-79.9-0AW	SGR-79.9-0A4W	81.0	82.0	104.1	7.5
SGR-81.1-0AW	SGR-81.1-0A4W	82.1	83.1	104.1	7.5
SGR-82.1-0AW	SGR-82.1-0A4W	83.2	84.1	104.1	7.5
SGR-83.1-0AW	SGR-83.1-0A4W	84.2	85.2	104.1	7.5
SGR-84.2-0AW	SGR-84.2-0A4W	85.3	86.2	104.1	7.5
SGR-85.2-0AW	SGR-85.2-0A4W	86.3	87.2	116.8	7.5
SGR-86.3-0AW	SGR-86.3-0A4W	87.3	88.4	116.8	7.5
SGR-87.4-0AW	SGR-87.4-0A4W	88.5	89.4	116.8	7.5
SGR-88.4-0AW	SGR-88.4-0A4W	89.5	90.4	116.8	7.5
SGR-89.4-0AW	SGR-89.4-0A4W	90.5	91.6	116.8	7.5
SGR-90.6-0AW	SGR-90.6-0A4W	91.7	92.6	116.8	7.5
SGR-91.6-0AW	SGR-91.6-0A4W	92.7	93.6	116.8	7.5
SGR-92.6-0AW	SGR-92.6-0A4W	93.7	94.7	116.8	7.5
SGR-93.8-0AW	SGR-93.8-0A4W	94.8	95.8	116.8	7.5
SGR-94.8-0AW	SGR-94.8-0A4W	95.9	96.8	116.8	7.5
SGR-95.8-0AW	SGR-95.8-0A4W	96.9	97.9	116.8	7.5
SGR-96.9-0AW	SGR-96.9-0A4W	98.0	98.9	116.8	7.5
SGR-97.9-0AW	SGR-97.9-0A4W	99.0	99.9	129.5	7.5
SGR-99.0-0AW	SGR-99.0-0A4W	100.0	101.1	129.5	7.5
SGR-100.1-0AW	SGR-100.1-0A4W	101.2	102.1	129.5	7.5
SGR-101.1-0AW	SGR-101.1-0A4W	102.2	103.1	129.5	7.5
SGR-102.1-0AW	SGR-102.1-0A4W	103.2	104.3	129.5	7.5
SGR-103.3-0AW	SGR-103.3-0A4W	104.4	105.3	129.5	7.5
SGR-104.3-0AW	SGR-104.3-0A4W	105.4	106.3	129.5	7.5
SGR-105.3-0AW	SGR-105.3-0A4W	106.4	107.4	129.5	7.5
SGR-106.5-0AW	SGR-106.5-0A4W	107.5	108.5	129.5	7.5
SGR-107.5-0AW	SGR-107.5-0A4W	108.6	109.5	129.5	7.5
SGR-108.5-0AW	SGR-108.5-0A4W	109.6	110.6	129.5	7.5
SGR-109.6-0AW	SGR-109.6-0A4W	110.7	111.6	129.5	7.5
SGR-110.6-0AW	SGR-110.6-0A4W	111.7	112.6	142.2	7.5
SGR-111.7-0AW	SGR-111.7-0A4W	112.7	113.8	142.2	7.5
SGR-112.8-0AW	SGR-112.8-0A4W	113.9	114.8	142.2	7.5
SGR-113.8-0AW	SGR-113.8-0A4W	114.9	115.8	142.2	7.5
SGR-114.8-0AW	SGR-114.8-0A4W	115.9	117.0	142.2	7.5
SGR-116.0-0AW	SGR-116.0-0A4W	117.1	118.0	142.2	7.5
SGR-117.0-0AW	SGR-117.0-0A4W	118.1	119.0	142.2	7.5
SGR-118.0-0AW	SGR-118.0-0A4W	119.1	120.1	142.2	7.5
SGR-119.2-0AW	SGR-119.2-0A4W	120.2	121.2	142.2	7.5
SGR-120.2-0AW	SGR-120.2-0A4W	121.3	122.2	142.2	7.5
SGR-121.2-0AW	SGR-121.2-0A4W	122.3	123.3	142.2	7.5
SGR-122.3-0AW	SGR-122.3-0A4W	123.4	124.3	142.2	7.5
SGR-123.3-0AW	SGR-123.3-0A4W	124.4	125.3	154.9	7.5
SGR-124.4-0AW	SGR-124.4-0A4W	125.4	126.5	154.9	7.5
SGR-125.5-0AW	SGR-125.5-0A4W	126.6	127.5	154.9	7.5
SGR-126.5-0AW	SGR-126.5-0A4W	127.6	128.5	154.9	7.5
SGR-127.5-0AW	SGR-127.5-0A4W	128.6	129.7	154.9	7.5
SGR-128.7-0AW	SGR-128.7-0A4W	129.8	130.7	154.9	7.5
SGR-129.7-0AW	SGR-129.7-0A4W	130.8	131.7	154.9	7.5
SGR-130.7-0AW	SGR-130.7-0A4W	131.8	132.8	154.9	7.5
SGR-131.9-0AW	SGR-131.9-0A4W	132.9	133.9	154.9	7.5
SGR-132.9-0AW	SGR-132.9-0A4W	134.0	134.9	154.9	7.5
SGR-133.9-0AW	SGR-133.9-0A4W	135.0	136.0	154.9	7.5
SGR-135.0-0AW	SGR-135.0-0A4W	136.1	137.0	154.9	7.5
SGR-136.0-0AW	SGR-136.0-0A4W	137.1	138.0	167.6	7.5
SGR-137.1-0AW	SGR-137.1-0A4W	138.1	139.2	167.6	7.5
SGR-138.2-0AW	SGR-138.2-0A4W	139.3	140.2	167.6	7.5
SGR-139.2-0AW	SGR-139.2-0A4W	140.3	141.2	167.6	7.5
SGR-140.2-0AW	SGR-140.2-0A4W	141.3	142.4	167.6	7.5
SGR-141.4-0AW	SGR-141.4-0A4W	142.5	143.4	167.6	7.5
SGR-142.4-0AW	SGR-142.4-0A4W	143.5	144.4	167.6	7.5
SGR-143.4-0AW	SGR-143.4-0A4W	144.5	145.5	167.6	7.5
SGR-144.6-0AW	SGR-144.6-0A4W	145.6	146.6	167.6	7.5
SGR-145.6-0AW	SGR-145.6-0A4W	146.7	147.6	167.6	7.5
SGR-146.6-0AW	SGR-146.6-0A4W	147.7	148.7	167.6	7.5
SGR-147.7-0AW	SGR-147.7-0A4W	148.8	149.7	167.6	7.5
SGR-148.7-0AW	SGR-148.7-0A4W	149.8	150.7	180.3	7.5
SGR-149.8-0AW	SGR-149.8-0A4W	150.8	151.9	180.3	7.5
SGR-150.9-0AW	SGR-150.9-0A4W	152.0	152.9	180.3	7.5

Conductive Epoxy Included



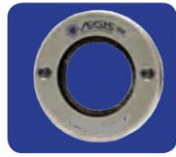
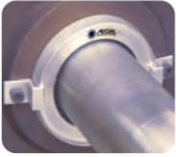


## Standard, Split Ring, and Bolt Through Mounting

Dimensions in mm

Standard SGR Catalog Number	Split Ring* Catalog Number	Bolt Through* Catalog Number	Min. shaft diameter	Max. shaft diameter	Outside diameter	Thickness Max
SGR-6.9-2	SGR-6.9-2A4	SGR-6.9-3	7.9	9.0	40.6	7.5
SGR-8.0-2	SGR-8.0-2A4	SGR-8.0-3	9.1	10.0	40.6	7.5
SGR-9.0-2	SGR-9.0-2A4	SGR-9.0-3	10.1	11.0	40.6	7.5
SGR-10.1-2	SGR-10.1-2A4	SGR-10.1-3	11.1	12.2	40.6	7.5
SGR-11.2-2	SGR-11.2-2A4	SGR-11.2-3	12.3	13.2	40.6	7.5
SGR-12.2-2	SGR-12.2-2A4	SGR-12.2-3	13.3	14.2	40.6	7.5
SGR-13.2-2	SGR-13.2-2A4	SGR-13.2-3	14.3	15.4	40.6	7.5
SGR-14.4-2	SGR-14.4-2A4	SGR-14.4-3	15.5	16.4	40.6	7.5
SGR-15.4-2	SGR-15.4-2A4	SGR-15.4-3	16.5	17.4	53.3	7.5
SGR-16.4-2	SGR-16.4-2A4	SGR-16.4-3	17.5	18.5	53.3	7.5
SGR-17.6-2	SGR-17.6-2A4	SGR-17.6-3	18.6	19.7	53.3	7.5
SGR-18.7-2	SGR-18.7-2A4	SGR-18.7-3	19.8	20.7	53.3	7.5
SGR-19.7-2	SGR-19.7-2A4	SGR-19.7-3	20.8	21.7	53.3	7.5
SGR-20.7-2	SGR-20.7-2A4	SGR-20.7-3	21.8	22.7	53.3	7.5
SGR-21.7-2	SGR-21.7-2A4	SGR-21.7-3	22.8	23.7	53.3	7.5
SGR-22.8-2	SGR-22.8-2A4	SGR-22.8-3	23.8	24.9	53.3	7.5
SGR-23.9-2	SGR-23.9-2A4	SGR-23.9-3	25.0	25.9	53.3	7.5
SGR-24.9-2	SGR-24.9-2A4	SGR-24.9-3	26.0	26.9	53.3	7.5
SGR-25.9-2	SGR-25.9-2A4	SGR-25.9-3	27.0	28.1	53.3	7.5
SGR-27.1-2	SGR-27.1-2A4	SGR-27.1-3	28.2	29.1	53.3	7.5
SGR-28.1-2	SGR-28.1-2A4	SGR-28.1-3	29.2	30.1	53.3	7.5
SGR-29.1-2	SGR-29.1-2A4	SGR-29.1-3	30.2	31.2	53.3	7.5
SGR-30.3-2	SGR-30.3-2A4	SGR-30.3-3	31.3	32.3	53.3	7.5
SGR-31.3-2	SGR-31.3-2A4	SGR-31.3-3	32.4	33.3	53.3	7.5
SGR-32.3-2	SGR-32.3-2A4	SGR-32.3-3	33.4	34.4	53.3	7.5
SGR-33.4-2	SGR-33.4-2A4	SGR-33.4-3	34.5	35.4	53.3	7.5
SGR-34.4-2	SGR-34.4-2A4	SGR-34.4-3	35.5	36.4	68.1	7.5
SGR-35.5-2	SGR-35.5-2A4	SGR-35.5-3	36.5	37.6	68.1	7.5
SGR-36.6-2	SGR-36.6-2A4	SGR-36.6-3	37.7	38.6	68.1	7.5
SGR-37.6-2	SGR-37.6-2A4	SGR-37.6-3	38.7	39.6	68.1	7.5
SGR-38.6-2	SGR-38.6-2A4	SGR-38.6-3	39.7	40.8	68.1	7.5
SGR-39.8-2	SGR-39.8-2A4	SGR-39.8-3	40.9	41.8	68.1	7.5
SGR-40.8-2	SGR-40.8-2A4	SGR-40.8-3	41.9	42.8	68.1	7.5
SGR-41.8-2	SGR-41.8-2A4	SGR-41.8-3	42.9	43.9	68.1	7.5
SGR-43.0-2	SGR-43.0-2A4	SGR-43.0-3	44.0	45.0	68.1	7.5
SGR-44.0-2	SGR-44.0-2A4	SGR-44.0-3	45.1	46.0	68.1	7.5
SGR-45.0-2	SGR-45.0-2A4	SGR-45.0-3	46.1	47.1	68.1	7.5
SGR-46.1-2	SGR-46.1-2A4	SGR-46.1-3	47.2	48.1	68.1	7.5
SGR-47.1-2	SGR-47.1-2A4	SGR-47.1-3	48.2	49.1	68.1	7.5
SGR-48.2-2	SGR-48.2-2A4	SGR-48.2-3	49.2	50.3	68.1	7.5
SGR-49.3-2	SGR-49.3-2A4	SGR-49.3-3	50.4	51.3	68.1	7.5
SGR-50.3-2	SGR-50.3-2A4	SGR-50.3-3	51.4	52.3	78.7	7.5
SGR-51.3-2	SGR-51.3-2A4	SGR-51.3-3	52.4	53.5	78.7	7.5
SGR-52.5-2	SGR-52.5-2A4	SGR-52.5-3	53.6	54.5	78.7	7.5
SGR-53.5-2	SGR-53.5-2A4	SGR-53.5-3	54.6	55.5	78.7	7.5
SGR-54.5-2	SGR-54.5-2A4	SGR-54.5-3	55.6	56.6	78.7	7.5
SGR-55.7-2	SGR-55.7-2A4	SGR-55.7-3	56.7	57.7	78.7	7.5
SGR-56.7-2	SGR-56.7-2A4	SGR-56.7-3	57.8	58.7	78.7	7.5
SGR-57.7-2	SGR-57.7-2A4	SGR-57.7-3	58.8	59.8	78.7	7.5
SGR-58.8-2	SGR-58.8-2A4	SGR-58.8-3	59.9	60.8	78.7	7.5
SGR-59.8-2	SGR-59.8-2A4	SGR-59.8-3	60.9	61.8	91.4	7.5
SGR-60.9-2	SGR-60.9-2A4	SGR-60.9-3	61.9	63.0	91.4	7.5
SGR-62.0-2	SGR-62.0-2A4	SGR-62.0-3	63.1	64.0	91.4	7.5
SGR-63.0-2	SGR-63.0-2A4	SGR-63.0-3	64.1	65.0	91.4	7.5
SGR-64.0-2	SGR-64.0-2A4	SGR-64.0-3	65.1	66.2	91.4	7.5
SGR-65.2-2	SGR-65.2-2A4	SGR-65.2-3	66.3	67.2	91.4	7.5
SGR-66.2-2	SGR-66.2-2A4	SGR-66.2-3	67.3	68.2	91.4	7.5
SGR-67.2-2	SGR-67.2-2A4	SGR-67.2-3	68.3	69.3	91.4	7.5
SGR-68.4-2	SGR-68.4-2A4	SGR-68.4-3	69.4	70.4	91.4	7.5
SGR-69.4-2	SGR-69.4-2A4	SGR-69.4-3	70.5	71.4	91.4	7.5
SGR-70.4-2	SGR-70.4-2A4	SGR-70.4-3	71.5	72.5	91.4	7.5
SGR-71.5-2	SGR-71.5-2A4	SGR-71.5-3	72.6	73.5	91.4	7.5
SGR-72.5-2	SGR-72.5-2A4	SGR-72.5-3	73.6	74.5	104.1	7.5
SGR-73.6-2	SGR-73.6-2A4	SGR-73.6-3	74.6	75.7	104.1	7.5
SGR-74.7-2	SGR-74.7-2A4	SGR-74.7-3	75.8	76.7	104.1	7.5
SGR-75.7-2	SGR-75.7-2A4	SGR-75.7-3	76.8	77.7	104.1	7.5
SGR-76.7-2	SGR-76.7-2A4	SGR-76.7-3	77.8	78.9	104.1	7.5
SGR-77.9-2	SGR-77.9-2A4	SGR-77.9-3	79.0	79.9	104.1	7.5
SGR-78.9-2	SGR-78.9-2A4	SGR-78.9-3	80.0	80.9	104.1	7.5





# Standard, Split Ring, and Bolt Through Mounting

Dimensions in mm

Standard SGR Catalog Number	Split Ring* Catalog Number	Bolt Through* Catalog Number	Min. shaft diameter	Max. shaft diameter	Outside diameter	Thickness Max
SGR-79.9-2	SGR-79.9-2A4	SGR-79.9-3	81.0	82.0	104.1	7.5
SGR-81.1-2	SGR-81.1-2A4	SGR-81.1-3	82.1	83.1	104.1	7.5
SGR-82.1-2	SGR-82.1-2A4	SGR-82.1-3	83.2	84.1	104.1	7.5
SGR-83.1-2	SGR-83.1-2A4	SGR-83.1-3	84.2	85.2	104.1	7.5
SGR-84.2-2	SGR-84.2-2A4	SGR-84.2-3	85.3	86.2	104.1	7.5
SGR-85.2-2	SGR-85.2-2A4	SGR-85.2-3	86.3	87.2	116.8	7.5
SGR-86.3-2	SGR-86.3-2A4	SGR-86.3-3	87.3	88.4	116.8	7.5
SGR-87.4-2	SGR-87.4-2A4	SGR-87.4-3	88.5	89.4	116.8	7.5
SGR-88.4-2	SGR-88.4-2A4	SGR-88.4-3	89.5	90.4	116.8	7.5
SGR-89.4-2	SGR-89.4-2A4	SGR-89.4-3	90.5	91.6	116.8	7.5
SGR-90.6-2	SGR-90.6-2A4	SGR-90.6-3	91.7	92.6	116.8	7.5
SGR-91.6-2	SGR-91.6-2A4	SGR-91.6-3	92.7	93.6	116.8	7.5
SGR-92.6-2	SGR-92.6-2A4	SGR-92.6-3	93.7	94.7	116.8	7.5
SGR-93.8-2	SGR-93.8-2A4	SGR-93.8-3	94.8	95.8	116.8	7.5
SGR-94.8-2	SGR-94.8-2A4	SGR-94.8-3	95.9	96.8	116.8	7.5
SGR-95.8-2	SGR-95.8-2A4	SGR-95.8-3	96.9	97.9	116.8	7.5
SGR-96.9-2	SGR-96.9-2A4	SGR-96.9-3	98.0	98.9	116.8	7.5
SGR-97.9-2	SGR-97.9-2A4	SGR-97.9-3	99.0	99.9	129.5	7.5
SGR-99.0-2	SGR-99.0-2A4	SGR-99.0-3	100.0	101.1	129.5	7.5
SGR-100.1-2	SGR-100.1-2A4	SGR-100.1-3	101.2	102.1	129.5	7.5
SGR-101.1-2	SGR-101.1-2A4	SGR-101.1-3	102.2	103.1	129.5	7.5
SGR-102.1-2	SGR-102.1-2A4	SGR-102.1-3	103.2	104.3	129.5	7.5
SGR-103.3-2	SGR-103.3-2A4	SGR-103.3-3	104.4	105.3	129.5	7.5
SGR-104.3-2	SGR-104.3-2A4	SGR-104.3-3	105.4	106.3	129.5	7.5
SGR-105.3-2	SGR-105.3-2A4	SGR-105.3-3	106.4	107.4	129.5	7.5
SGR-106.5-2	SGR-106.5-2A4	SGR-106.5-3	107.5	108.5	129.5	7.5
SGR-107.5-2	SGR-107.5-2A4	SGR-107.5-3	108.6	109.5	129.5	7.5
SGR-108.5-2	SGR-108.5-2A4	SGR-108.5-3	109.6	110.6	129.5	7.5
SGR-109.6-2	SGR-109.6-2A4	SGR-109.6-3	110.7	111.6	129.5	7.5
SGR-110.6-2	SGR-110.6-2A4	SGR-110.6-3	111.7	112.6	142.2	7.5
SGR-111.7-2	SGR-111.7-2A4	SGR-111.7-3	112.7	113.8	142.2	7.5
SGR-112.8-2	SGR-112.8-2A4	SGR-112.8-3	113.9	114.8	142.2	7.5
SGR-113.8-2	SGR-113.8-2A4	SGR-113.8-3	114.9	115.8	142.2	7.5
SGR-114.8-2	SGR-114.8-2A4	SGR-114.8-3	115.9	117.0	142.2	7.5
SGR-116.0-2	SGR-116.0-2A4	SGR-116.0-3	117.1	118.0	142.2	7.5
SGR-117.0-2	SGR-117.0-2A4	SGR-117.0-3	118.1	119.0	142.2	7.5
SGR-118.0-2	SGR-118.0-2A4	SGR-118.0-3	119.1	120.1	142.2	7.5
SGR-119.2-2	SGR-119.2-2A4	SGR-119.2-3	120.2	121.2	142.2	7.5
SGR-120.2-2	SGR-120.2-2A4	SGR-120.2-3	121.3	122.2	142.2	7.5
SGR-121.2-2	SGR-121.2-2A4	SGR-121.2-3	122.3	123.3	142.2	7.5
SGR-122.3-2	SGR-122.3-2A4	SGR-122.3-3	123.4	124.3	142.2	7.5
SGR-123.3-2	SGR-123.3-2A4	SGR-123.3-3	124.4	125.3	154.9	7.5
SGR-124.4-2	SGR-124.4-2A4	SGR-124.4-3	125.4	126.5	154.9	7.5
SGR-125.5-2	SGR-125.5-2A4	SGR-125.5-3	126.6	127.5	154.9	7.5
SGR-126.5-2	SGR-126.5-2A4	SGR-126.5-3	127.6	128.5	154.9	7.5
SGR-127.5-2	SGR-127.5-2A4	SGR-127.5-3	128.6	129.7	154.9	7.5
SGR-128.7-2	SGR-128.7-2A4	SGR-128.7-3	129.8	130.7	154.9	7.5
SGR-129.7-2	SGR-129.7-2A4	SGR-129.7-3	130.8	131.7	154.9	7.5
SGR-130.7-2	SGR-130.7-2A4	SGR-130.7-3	131.8	132.8	154.9	7.5
SGR-131.9-2	SGR-131.9-2A4	SGR-131.9-3	132.9	133.9	154.9	7.5
SGR-132.9-2	SGR-132.9-2A4	SGR-132.9-3	134.0	134.9	154.9	7.5
SGR-133.9-2	SGR-133.9-2A4	SGR-133.9-3	135.0	136.0	154.9	7.5
SGR-135.0-2	SGR-135.0-2A4	SGR-135.0-3	136.1	137.0	154.9	7.5
SGR-136.0-2	SGR-136.0-2A4	SGR-136.0-3	137.1	138.0	167.6	7.5
SGR-137.1-2	SGR-137.1-2A4	SGR-137.1-3	138.1	139.2	167.6	7.5
SGR-138.2-2	SGR-138.2-2A4	SGR-138.2-3	139.3	140.2	167.6	7.5
SGR-139.2-2	SGR-139.2-2A4	SGR-139.2-3	140.3	141.2	167.6	7.5
SGR-140.2-2	SGR-140.2-2A4	SGR-140.2-3	141.3	142.4	167.6	7.5
SGR-141.4-2	SGR-141.4-2A4	SGR-141.4-3	142.5	143.4	167.6	7.5
SGR-142.4-2	SGR-142.4-2A4	SGR-142.4-3	143.5	144.4	167.6	7.5
SGR-143.4-2	SGR-143.4-2A4	SGR-143.4-3	144.5	145.5	167.6	7.5
SGR-144.6-2	SGR-144.6-2A4	SGR-144.6-3	145.6	146.6	167.6	7.5
SGR-145.6-2	SGR-145.6-2A4	SGR-145.6-3	146.7	147.6	167.6	7.5
SGR-146.6-2	SGR-146.6-2A4	SGR-146.6-3	147.7	148.7	167.6	7.5
SGR-147.7-2	SGR-147.7-2A4	SGR-147.7-3	148.8	149.7	167.6	7.5
SGR-148.7-2	SGR-148.7-2A4	SGR-148.7-3	149.8	150.7	180.3	7.5
SGR-149.8-2	SGR-149.8-2A4	SGR-149.8-3	150.8	151.9	180.3	7.5
SGR-150.9-2	SGR-150.9-2A4	SGR-150.9-3	152.0	152.9	180.3	7.5



# AEGIS® SGR - Press Fit Mounting

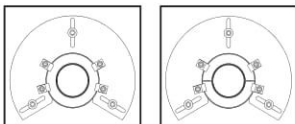
Dimensions in mm

Catalog Number	Min.shaft diameter	Max.shaft diameter	SGR OD Tolerance +0/-0.025	Thickness Max	Bore Tolerance +0.025/-0	Catalog Number	Min.shaft diameter	Max.shaft diameter	SGR OD Tolerance +0/-0.025	Thickness Max	Bore Tolerance +0.025/-0
SGR-6.9-0A6	7.9	9.0	40.132	7.5	40.030	SGR-79.9-0A6	81.0	82.0	103.632	7.5	103.530
SGR-8.0-0A6	9.1	10.0	40.132	7.5	40.030	SGR-81.1-0A6	82.1	83.1	103.632	7.5	103.530
SGR-9.0-0A6	10.1	11.0	40.132	7.5	40.030	SGR-82.1-0A6	83.2	84.1	103.632	7.5	103.530
SGR-10.1-0A6	11.1	12.2	40.132	7.5	40.030	SGR-83.1-0A6	84.2	85.2	103.632	7.5	103.530
SGR-11.2-0A6	12.3	13.2	40.132	7.5	40.030	SGR-84.2-0A6	85.3	86.2	103.632	7.5	103.530
SGR-12.2-0A6	13.3	14.2	40.132	7.5	40.030	SGR-85.2-0A6	86.3	87.2	116.332	7.5	116.230
SGR-13.2-0A6	14.3	15.4	40.132	7.5	40.030	SGR-86.3-0A6	87.3	88.4	116.332	7.5	116.230
SGR-14.4-0A6	15.5	16.4	40.132	7.5	40.030	SGR-87.4-0A6	88.5	89.4	116.332	7.5	116.230
SGR-15.4-0A6	16.5	17.4	52.832	7.5	52.730	SGR-88.4-0A6	89.5	90.4	116.332	7.5	116.230
SGR-16.4-0A6	17.5	18.5	52.832	7.5	52.730	SGR-89.4-0A6	90.5	91.6	116.332	7.5	116.230
SGR-17.6-0A6	18.6	19.7	52.832	7.5	52.730	SGR-90.6-0A6	91.7	92.6	116.332	7.5	116.230
SGR-18.7-0A6	19.8	20.7	52.832	7.5	52.730	SGR-91.6-0A6	92.7	93.6	116.332	7.5	116.230
SGR-19.7-0A6	20.8	21.7	52.832	7.5	52.730	SGR-92.6-0A6	93.7	94.7	116.332	7.5	116.230
SGR-20.7-0A6	21.8	22.7	52.832	7.5	52.730	SGR-93.8-0A6	94.8	95.8	116.332	7.5	116.230
SGR-21.7-0A6	22.8	23.7	52.832	7.5	52.730	SGR-94.8-0A6	95.9	96.8	116.332	7.5	116.230
SGR-22.8-0A6	23.8	24.9	52.832	7.5	52.730	SGR-95.8-0A6	96.9	97.9	116.332	7.5	116.230
SGR-23.9-0A6	25.0	25.9	52.832	7.5	52.730	SGR-96.9-0A6	98.0	98.9	116.332	7.5	116.230
SGR-24.9-0A6	26.0	26.9	52.832	7.5	52.730	SGR-97.9-0A6	99.0	99.9	129.032	7.5	128.930
SGR-25.9-0A6	27.0	28.1	52.832	7.5	52.730	SGR-99.0-0A6	100.0	101.1	129.032	7.5	128.930
SGR-27.1-0A6	28.2	29.1	52.832	7.5	52.730	SGR-100.1-0A6	101.2	102.1	129.032	7.5	128.930
SGR-28.1-0A6	29.2	30.1	52.832	7.5	52.730	SGR-101.1-0A6	102.2	103.1	129.032	7.5	128.930
SGR-29.1-0A6	30.2	31.2	52.832	7.5	52.730	SGR-102.1-0A6	103.2	104.3	129.032	7.5	128.930
SGR-30.3-0A6	31.3	32.3	52.832	7.5	52.730	SGR-103.3-0A6	104.4	105.3	129.032	7.5	128.930
SGR-31.3-0A6	32.4	33.3	52.832	7.5	52.730	SGR-104.3-0A6	105.4	106.3	129.032	7.5	128.930
SGR-32.3-0A6	33.4	34.4	52.832	7.5	52.730	SGR-105.3-0A6	106.4	107.4	129.032	7.5	128.930
SGR-33.4-0A6	34.5	35.4	52.832	7.5	52.730	SGR-106.5-0A6	107.5	108.5	129.032	7.5	128.930
SGR-34.4-0A6	35.5	36.4	67.564	7.5	67.462	SGR-107.5-0A6	108.6	109.5	129.032	7.5	128.930
SGR-35.5-0A6	36.5	37.6	67.564	7.5	67.462	SGR-108.5-0A6	109.6	110.6	129.032	7.5	128.930
SGR-36.6-0A6	37.7	38.6	67.564	7.5	67.462	SGR-109.6-0A6	110.7	111.6	129.032	7.5	128.930
SGR-37.6-0A6	38.7	39.6	67.564	7.5	67.462	SGR-110.6-0A6	111.7	112.6	141.732	7.5	141.630
SGR-38.6-0A6	39.7	40.8	67.564	7.5	67.462	SGR-111.7-0A6	112.7	113.8	141.732	7.5	141.630
SGR-39.8-0A6	40.9	41.8	67.564	7.5	67.462	SGR-112.8-0A6	113.9	114.8	141.732	7.5	141.630
SGR-40.8-0A6	41.9	42.8	67.564	7.5	67.462	SGR-113.8-0A6	114.9	115.8	141.732	7.5	141.630
SGR-41.8-0A6	42.9	43.9	67.564	7.5	67.462	SGR-114.8-0A6	115.9	117.0	141.732	7.5	141.630
SGR-43.0-0A6	44.0	45.0	67.564	7.5	67.462	SGR-116.0-0A6	117.1	118.0	141.732	7.5	141.630
SGR-44.0-0A6	45.1	46.0	67.564	7.5	67.462	SGR-117.0-0A6	118.1	119.0	141.732	7.5	141.630
SGR-45.0-0A6	46.1	47.1	67.564	7.5	67.462	SGR-118.0-0A6	119.1	120.1	141.732	7.5	141.630
SGR-46.1-0A6	47.2	48.1	67.564	7.5	67.462	SGR-119.2-0A6	120.2	121.2	141.732	7.5	141.630
SGR-47.1-0A6	48.2	49.1	67.564	7.5	67.462	SGR-120.2-0A6	121.3	122.2	141.732	7.5	141.630
SGR-48.2-0A6	49.2	50.3	67.564	7.5	67.462	SGR-121.2-0A6	122.3	123.3	141.732	7.5	141.630
SGR-49.3-0A6	50.4	51.3	67.564	7.5	67.462	SGR-122.3-0A6	123.4	124.3	141.732	7.5	141.630
SGR-50.3-0A6	51.4	52.3	78.232	7.5	78.130	SGR-123.3-0A6	124.4	125.3	154.432	7.5	154.330
SGR-51.3-0A6	52.4	53.5	78.232	7.5	78.130	SGR-124.4-0A6	125.4	126.5	154.432	7.5	154.330
SGR-52.5-0A6	53.6	54.5	78.232	7.5	78.130	SGR-125.5-0A6	126.6	127.5	154.432	7.5	154.330
SGR-53.5-0A6	54.6	55.5	78.232	7.5	78.130	SGR-126.5-0A6	127.6	128.5	154.432	7.5	154.330
SGR-54.5-0A6	55.6	56.6	78.232	7.5	78.130	SGR-127.5-0A6	128.6	129.7	154.432	7.5	154.330
SGR-55.7-0A6	56.7	57.7	78.232	7.5	78.130	SGR-128.7-0A6	129.8	130.7	154.432	7.5	154.330
SGR-56.7-0A6	57.8	58.7	78.232	7.5	78.130	SGR-129.7-0A6	130.8	131.7	154.432	7.5	154.330
SGR-57.7-0A6	58.8	59.8	78.232	7.5	78.130	SGR-130.7-0A6	131.8	132.8	154.432	7.5	154.330
SGR-58.8-0A6	59.9	60.8	78.232	7.5	78.130	SGR-131.9-0A6	132.9	133.9	154.432	7.5	154.330
SGR-59.8-0A6	60.9	61.8	90.932	7.5	90.830	SGR-132.9-0A6	134.0	134.9	154.432	7.5	154.330
SGR-60.9-0A6	61.9	63.0	90.932	7.5	90.830	SGR-133.9-0A6	135.0	136.0	154.432	7.5	154.330
SGR-62.0-0A6	63.1	64.0	90.932	7.5	90.830	SGR-135.0-0A6	136.1	137.0	154.432	7.5	154.330
SGR-63.0-0A6	64.1	65.0	90.932	7.5	90.830	SGR-136.0-0A6	137.1	138.0	167.132	7.5	167.030
SGR-64.0-0A6	65.1	66.2	90.932	7.5	90.830	SGR-137.1-0A6	138.1	139.2	167.132	7.5	167.030
SGR-65.2-0A6	66.3	67.2	90.932	7.5	90.830	SGR-138.2-0A6	139.3	140.2	167.132	7.5	167.030
SGR-66.2-0A6	67.3	68.2	90.932	7.5	90.830	SGR-139.2-0A6	140.3	141.2	167.132	7.5	167.030
SGR-67.2-0A6	68.3	69.3	90.932	7.5	90.830	SGR-140.2-0A6	141.3	142.4	167.132	7.5	167.030
SGR-68.4-0A6	69.4	70.4	90.932	7.5	90.830	SGR-141.4-0A6	142.5	143.4	167.132	7.5	167.030
SGR-69.4-0A6	70.5	71.4	90.932	7.5	90.830	SGR-142.4-0A6	143.5	144.4	167.132	7.5	167.030
SGR-70.4-0A6	71.5	72.5	90.932	7.5	90.830	SGR-143.4-0A6	144.5	145.5	167.132	7.5	167.030
SGR-71.5-0A6	72.6	73.5	90.932	7.5	90.830	SGR-144.6-0A6	145.6	146.6	167.132	7.5	167.030
SGR-72.5-0A6	73.6	74.5	103.632	7.5	103.530	SGR-145.6-0A6	146.7	147.6	167.132	7.5	167.030
SGR-73.6-0A6	74.6	75.7	103.632	7.5	103.530	SGR-146.6-0A6	147.7	148.7	167.132	7.5	167.030
SGR-74.7-0A6	75.8	76.7	103.632	7.5	103.530	SGR-147.7-0A6	148.8	149.7	167.132	7.5	167.030
SGR-75.7-0A6	76.8	77.7	103.632	7.5	103.530	SGR-148.7-0A6	149.8	150.7	179.832	7.5	179.730
SGR-76.7-0A6	77.8	78.9	103.632	7.5	103.530	SGR-149.8-0A6	150.8	151.9	179.832	7.5	179.730
SGR-77.9-0A6	79.0	79.9	103.632	7.5	103.530	SGR-150.9-0A6	152.0	152.9	179.832	7.5	179.730
SGR-78.9-0A6	80.0	80.9	103.632	7.5	103.530						



# Bearing Protection Ring Kit for IEC Motors

**Kits include AEGIS® SGR Bearing Protection Ring and all mounting hardware**



IEC Motors Solid	IEC Motors Split			
Catalog Number	Catalog Number	IEC shaft diameter	IEC Frame	Plate OD
SGR-19-IEC	SGR-19-IEC-2A4	19mm	IEC 80 (2, 4, 6, 8 pole)	142mm
SGR-24-IEC	SGR-24-IEC-2A4	24mm	IEC 90S, 90L (2, 4, 6, 8 pole)	142mm
SGR-28-IEC	SGR-28-IEC-2A4	28mm	IEC 100L, 112M (2, 4, 6, 8 pole)	142mm
SGR-38-IEC	SGR-38-IEC-2A4	38mm	IEC 132S, 132M (2, 4, 6, 8 pole)	160mm
SGR-42-IEC	SGR-42-IEC-2A4	42mm	IEC 160M, 160L (2, 4, 6, 8 pole)	160mm
SGR-48-IEC	SGR-48-IEC-2A4	48mm	IEC 180M, 180L (2, 4, 6, 8 pole)	160mm
SGR-55-IEC	SGR-55-IEC-2A4	55mm	IEC 200L (2, 4, 6, 8 pole); IEC 225S, 225M (2 pole)	168mm
SGR-60-IEC	SGR-60-IEC-2A4	60mm	IEC 225S, 225M (4, 6, 8 pole); IEC 250M (2 pole)	168mm
SGR-65-IEC	SGR-65-IEC-2A4	65mm	IEC 250M (4, 6, 8 pole); IEC 280M, 280S, 315S, 315M, 315L (2 pole)	185mm
SGR-75-IEC	SGR-75-IEC-2A4	75mm	IEC 280S, 280M (4, 6, 8 pole); IEC 355M, 355L (2 pole)	193mm
SGR-80-IEC	SGR-80-IEC-2A4	80mm	IEC 315S, 315M, 315L (4, 6, 8 pole)	193mm
SGR-95-IEC	SGR-95-IEC-2A4	95mm	IEC 335L, 335M, 355L, 355M (4, 6, 8, 10 pole)	211mm

## Mounting Plates with Hardware (no SGR)

In occasions when the shaft diameter is not one of the kitted IEC sizes, select the correct SGR for the shaft diameter, note the SGR OD, then go to the chart (right) to determine the matching Mounting Plate. Plate can be used with a solid or split ring SGR.



SGR sold separately

English Hardware	Fits any SGR with OD as specified
Catalog Number	SGR OD
SGR-M40-1A4	1.60" (40.6mm)
SGR-M53-1A4	2.10" (53.3mm)
SGR-M68-1A4	2.68" (68.1mm)
SGR-M78-1A4	3.10" (78.8mm)
SGR-M91-1A4	3.60" (91.4mm)
SGR-M104-1A4	4.10" (104.1mm)
SGR-M116-1A4	4.60" (116.8mm)
SGR-M129-1A4	5.10" (129.5mm)
SGR-M142-1A4	5.60" (142.2mm)
SGR-M154-1A4	6.10" (154.9mm)
SGR-M167-1A4	6.60" (167.6mm)
SGR-M180-1A4	7.10" (180.3mm)

Kit includes (1) mounting plate,  
(3) 1/4" spacers with screws and washers  
(3) 1/2" spacers with screws and washers  
(3) 1" spacers with screws and washers

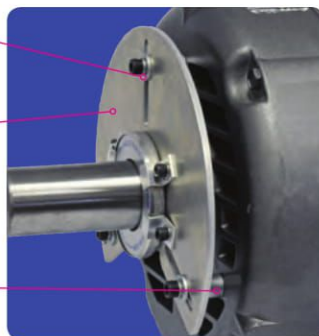
Metric Hardware	Fits any SGR with OD as specified
Catalog Number	SGR OD
SGR-M40-2A4	1.60" (40.6mm)
SGR-M53-2A4	2.10" (53.3mm)
SGR-M68-2A4	2.68" (68.1mm)
SGR-M78-2A4	3.10" (78.8mm)
SGR-M91-2A4	3.60" (91.4mm)
SGR-M104-2A4	4.10" (104.1mm)
SGR-M116-2A4	4.60" (116.8mm)
SGR-M129-2A4	5.10" (129.5mm)
SGR-M142-2A4	5.60" (142.2mm)
SGR-M154-2A4	6.10" (154.9mm)
SGR-M167-2A4	6.60" (167.6mm)
SGR-M180-2A4	7.10" (180.3mm)

Kit includes (1) mounting plate,  
(3) 7mm spacers with screws and washers  
(3) 17mm spacers with screws and washers  
(3) 27mm spacers with screws and washers

lock washer and flat washer

plate

spacer



## IEC Bearing Protection Ring Kit

### Solid



1 AEGIS® SGR

1 mounting plate

3 screws (inches or metric)

3 washers

3 lock washers

3 spacers\*

### Split



1 AEGIS® Split Ring SGR

1 split mounting plate

3 screws (inches or metric)

3 washers

3 lock washers

3 spacers\*

\* each kit includes 3 spacer lengths:  
7mm, 17mm, and 27mm



## AEGIS® Accessories

### AEGIS® SVP Shaft Voltage Probe Kits Conductive Microfiber tips for use with Fluke 190 Series II ScopeMeter®

For the first time you can easily and more accurately measure the voltage on a rotating shaft. The AEGIS® SVP Shaft Voltage Probe's unique design of high density conductive microfibers ensures continuous contact with the rotating shaft. Used with the Fluke 190 Series II ScopeMeter, you can determine if your motor is subject to potentially damaging bearing currents. Visit our website for a complete part list.

Catalog Number	Includes:
SVP-KIT-3000MB	3 SVP tips, probe holder with two piece extension rod (total length of probe holder with extension rod is 18 inches) and magnetic base. Aegis® Grounding Simulator (AGS-KIT-1).
SVP-KIT-3000	3 SVP tips, probe holder with two piece extension rod (total length of probe holder with extension rod is 18 inches). Aegis® Grounding Simulator (AGS-KIT-1).
SVP-TIP-3000	3 SVP replacement tips only

Fits Fluke VPS410 Voltage Probe.

Installation: Pull off the hook clip from the voltage probe. Install the SVP tip over the voltage probe tip until seated against the probe shoulder. Secure with plastic screw. Do not over tighten screw.

Note: 10:1 probe not included  
Magnetic base not sold separately



### AEGIS® Colloidal Silver Shaft Coating

Catalog Number	Coverage:
CS015	20-25 applications based on an 80mm shaft diameter

Used to improve the conductivity of the steel shaft surface. Apply to any VFD driven motor shaft prior to installing the AEGIS® Bearing Protection Ring.

Note: Shelf life is 6 months



### AEGIS® Conductive Epoxy

Catalog Number	Coverage:
EP2400	2-3 applications

Used to install the AEGIS® Bearing Protection Ring without drilling and tapping into the motor end bell.

Note: Shelf life is 9 months



# AEGIS® SGR uKIT for IEC motors

## Bearing Protection Ring with Universal Mounting Brackets

### AEGIS® SGR - Electrical Bearing Damage Protection™

The new AEGIS® Shaft Grounding Ring Kit with universal mounting brackets allows universal mounting options to fit almost any motor design in the IEC frames from 132M to 355M. The AEGIS® SGR uKIT includes:

- AEGIS® Bearing Protection Ring designed for the motor's shaft diameter
- Four mounting bracket styles and hardware to adapt the AEGIS® ring to virtually any end bracket
- Screw on or AEGIS® Conductive Epoxy Adhesive mounting capable (Epoxy EP2400 sold separately)
- Fits over slingers, seals or shaft shoulders

### PROBLEM

Without an AEGIS® Bearing Protection Ring, induced shaft voltages cause destructive bearing currents that can lead to catastrophic "fluting" damage, decrease bearing lubrication life, and premature motor failure.

#### Bearings fail without AEGIS® SGR



Shaft voltages



Fluted bearing race



### SOLUTION

The AEGIS® Bearing Protection Ring dramatically extends motor service life by safely channeling harmful VFD induced shaft voltages away from the motor's bearings to ground.

#### AEGIS® SGR protects bearings



No shaft voltages



Undamaged bearing race

# Technical Data for Solid and Split Ring uKIT Designs

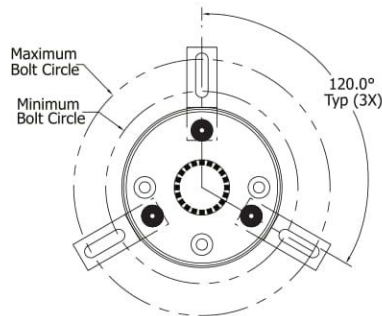
## AEGIS® SGR uKit Includes:

- (1) AEGIS® SGR Bearing Protection Ring
- (4) universal brackets sets
- (4) 5-40 x 3/8" flat head screws
- (4) M4 x 10mm socket head cap screws
- (4) M4 split lock washers
- (4) M4 flat washers
- 5/64" allen wrench
- 3mm allen wrench

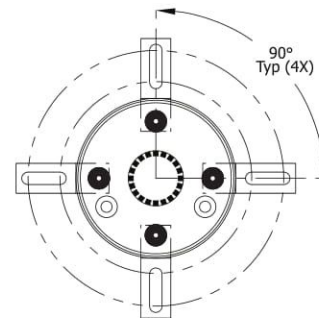
## Tools required for installation:

- 3.3mm drill (#30 drill in inches)
- M4 tap
- Fine grit emery cloth/sand paper
- CS015 AEGIS® Colloidal Silver Shaft Coating (recommended)

### SOLID RING ONLY Motor with 3 hole bracket pattern



### SOLID AND SPLIT RING Motor with 4 hole bracket pattern



Shaft	Min Circle	Max Circle
28 mm	74 mm	93 mm
38 mm	84 mm	103 mm
42 mm	88 mm	107 mm
48 mm	94 mm	113 mm
55 mm	101 mm	120 mm
60 mm	106 mm	125 mm
65 mm	111 mm	130 mm
70 mm	116 mm	135 mm
75 mm	121 mm	140 mm
80 mm	126 mm	145 mm
85 mm	131 mm	150 mm
90 mm	136 mm	155 mm
95 mm	141 mm	160 mm

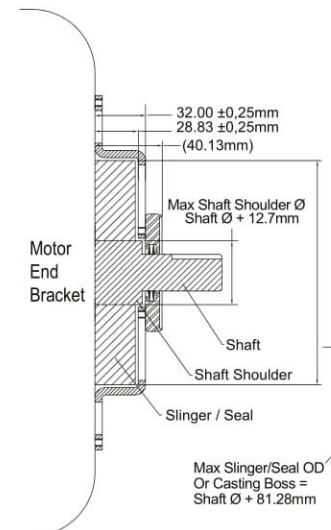
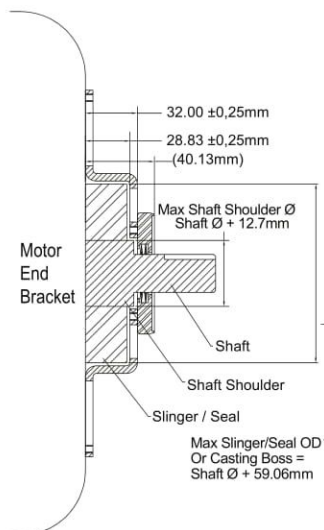
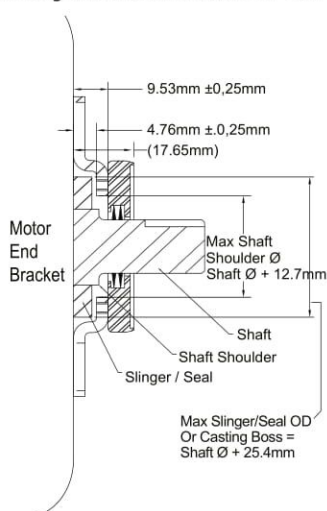
Mounting bolt circle is the same for 3 or 4 brackets



Shaft	Min Circle	Max Circle
28 mm	107 mm	148 mm
38 mm	117 mm	158 mm
42 mm	121 mm	162 mm
48 mm	127 mm	168 mm
55 mm	134 mm	175 mm
60 mm	139 mm	180 mm
65 mm	144 mm	185 mm
70 mm	149 mm	190 mm
75 mm	154 mm	195 mm
80 mm	159 mm	200 mm
85 mm	164 mm	205 mm
90 mm	169 mm	210 mm
95 mm	174 mm	215 mm



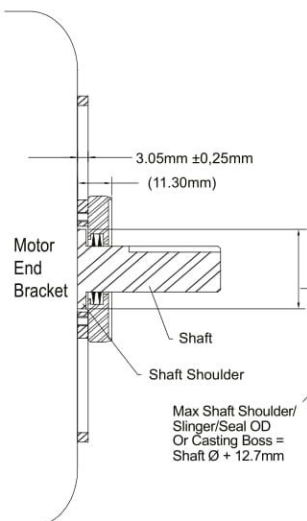
Shaft	Min Circle	Max Circle
28 mm	129 mm	148 mm
38 mm	139 mm	158 mm
42 mm	143 mm	162 mm
48 mm	149 mm	168 mm
55 mm	156 mm	175 mm
60 mm	161 mm	180 mm
65 mm	166 mm	185 mm
70 mm	171 mm	190 mm
75 mm	176 mm	195 mm
80 mm	181 mm	200 mm
85 mm	186 mm	205 mm
90 mm	191 mm	210 mm
95 mm	196 mm	215 mm



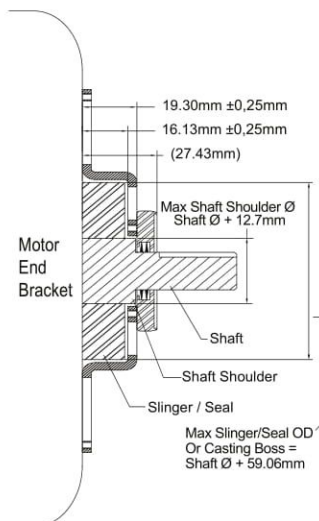




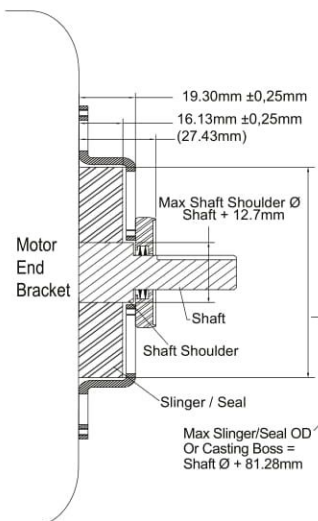
Shaft	Min Circle	Max Circle
28 mm	75 mm	121 mm
38 mm	85 mm	131 mm
42 mm	89 mm	135 mm
48 mm	95 mm	141 mm
55 mm	102 mm	148 mm
60 mm	107 mm	153 mm
65 mm	112 mm	158 mm
70 mm	117 mm	163 mm
75 mm	122 mm	168 mm
80 mm	127 mm	173 mm
85 mm	132 mm	178 mm
90 mm	137 mm	183 mm
95 mm	142 mm	188 mm



Shaft	Min Circle	Max Circle
28 mm	107 mm	148 mm
38 mm	117 mm	158 mm
42 mm	121 mm	162 mm
48 mm	127 mm	168 mm
55 mm	134 mm	175 mm
60 mm	139 mm	180 mm
65 mm	144 mm	185 mm
70 mm	149 mm	190 mm
75 mm	154 mm	195 mm
80 mm	159 mm	200 mm
85 mm	164 mm	205 mm
90 mm	169 mm	210 mm
95 mm	174 mm	215 mm



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65 mm	166 mm	185 mm
70 mm	171 mm	190 mm
75 mm	176 mm	195 mm
80 mm	181 mm	200 mm
85 mm	186 mm	205 mm
90 mm	191 mm	210 mm
95 mm	196 mm	215 mm



**Solid**



**Split**



Includes four mounting bracket styles and hardware to adapt the AEGIS® ring to virtually any end bracket

IEC uKIT Catalog Number Solid Ring	IEC uKIT Catalog Number Split Ring	IEC Motor shaft dia "D"	IEC Frame
SGR-28-UKIT	SGR-28-UKIT-2A4	28mm	IEC 100L, 112M (2, 4, 6, 8 pole)
SGR-38-UKIT	SGR-38-UKIT-2A4	38mm	IEC 132S, 132M (2, 4, 6, 8 pole)
SGR-42-UKIT	SGR-42-UKIT-2A4	42mm	IEC 160M, 160L (2, 4, 6, 8 pole)
SGR-48-UKIT	SGR-48-UKIT-2A4	48mm	IEC 180M, 180L (2, 4, 6, 8 pole)
SGR-55-UKIT	SGR-55-UKIT-2A4	55mm	IEC 200L (2, 4, 6, 8 pole); IEC 225S, 225M (2 pole)
SGR-60-UKIT	SGR-60-UKIT-2A4	60mm	IEC 225S, 225M (4, 6, 8 pole) ; IEC 250M (2 pole)
SGR-65-UKIT	SGR-65-UKIT-2A4	65mm	IEC 250M (4, 6, 8 pole); IEC 280M, 280S, 315S, 315M, 315L (2 pole)
SGR-70-UKIT	SGR-70-UKIT-2A4	70mm	
SGR-75-UKIT	SGR-75-UKIT-2A4	75mm	IEC 280S, 280M (4, 6, 8 pole); IEC 355M, 355L (2 pole)
SGR-80-UKIT	SGR-80-UKIT-2A4	80mm	IEC 315S, 315M, 315L (4, 6, 8 pole)
SGR-85-UKIT	SGR-85-UKIT-2A4	85mm	
SGR-90-UKIT	SGR-90-UKIT-2A4	90mm	
SGR-95-UKIT	SGR-95-UKIT-2A4	95mm	IEC 335L, 335M, 355L, 355M (4, 6, 8, 10 pole)

## Features and Benefits

- Protects both motor bearings and the bearings in attached equipment
- Channels harmful currents to ground
- Mounting brackets to fit virtually any motor
- Order the AEGIS® SGR based on the motor "D" dimension, clears slinger or shaft shoulder.
- Improves system reliability; maintenance-free
- Flexible 3 or 4 bracket mounting design



## Engineering Specification:

**All motors operated on variable frequency drives shall be equipped with a maintenance free, conductive micro fiber, shaft grounding ring with a minimum of two rows of circumferential micro fibers to discharge electrical shaft currents within the motor and/or its bearings.**

**Application Note: Motors up to 75kW shall be provided with a minimum of one shaft grounding ring installed either on the drive end or non-drive end. Motors over 75kW shall be provided with an insulated bearing on the non-drive end and a shaft grounding ring on the drive end of the motor. Grounding rings shall be provided and installed by the motor manufacturer or contractor and shall be installed in accordance with the manufacturer's recommendations.**

**Recommended part: AEGIS® SGR Bearing Protection Ring**

## Warranty:

Units are guaranteed for one year from date of purchase against defective materials and workmanship. Replacement will be made except for defects caused by abnormal use or mishandling. All statements and technical information contained herein, or presented by the manufacturer or his representative are rendered in good faith. User must assume responsibility to determine suitability of the product for intended use. The manufacturer shall not be liable for any injury, loss or damage, direct or consequential arising out of the use, or attempt to use the product.

Patent Numbers: 7,193,836 | 7,136,271 and other patents pending





For all enquiries, please contact us:

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