AA300 Seismic Source
Operation Manual
Inc Model AA301
CSP-1000-8002/6

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Thank you for choosing Applied Acoustic Engineering as one of your subsea equipment suppliers. We hope you experience many years of reliable operational use from our products.

If you do encounter any technical issues with any of our products then please don't hesitate to contact our Technical Team via the following methods.

Tel: +44 (0)1493 440355
Fax: +44 (0)1493 440720

Email: techsupport@appliedacoustics.com

Applied Acoustic Engineering Ltd has made every effort to ensure that the information contained in this manual is correct at time of print. However our policy of continual product improvement means that we cannot assume liability for any errors which may occur.

These written instructions must be followed fully for reliable and safe operation of the equipment that this manual refers to. Applied Acoustic Engineering Ltd cannot be held responsible for any issues arising from the improper use or maintenance of equipment referred to in this manual or failure of the operator to adhere to the instructions laid out in this manual. The user must be familiar with the contents of this manual before use or operation.

1. Introduction

The AA300 transducer or Boomer Plate is an electromechanical sound-producing device. The AA300 produces a high amplitude sharp (short duration) broad spectrum pulse which improves penetration by producing a higher source level than the AA200 without degrading comparable resolution.

The AA300 transducer's unique design provides a controllable pulse and improved heat dissipation resulting in a stable repeatable source.

The AA300 transducer is primarily a high resolution source designed to be used in conjunction with our range of Hydrophone arrays (AH Series) and our range of Seismic Power Sources (CSP Series).

2. Identification of Parts

The boomer can be broken down into 3 main assemblies; within the assemblies individual components can be replaced.

Upper Plate Assembly

This assembly consists of the upper plate, sealing O-rings and the oil pressure compensation bladder. The assembly is held in place by 24 equally spaced M6 bolts.

Plate / Electromagnetic Coil Housing

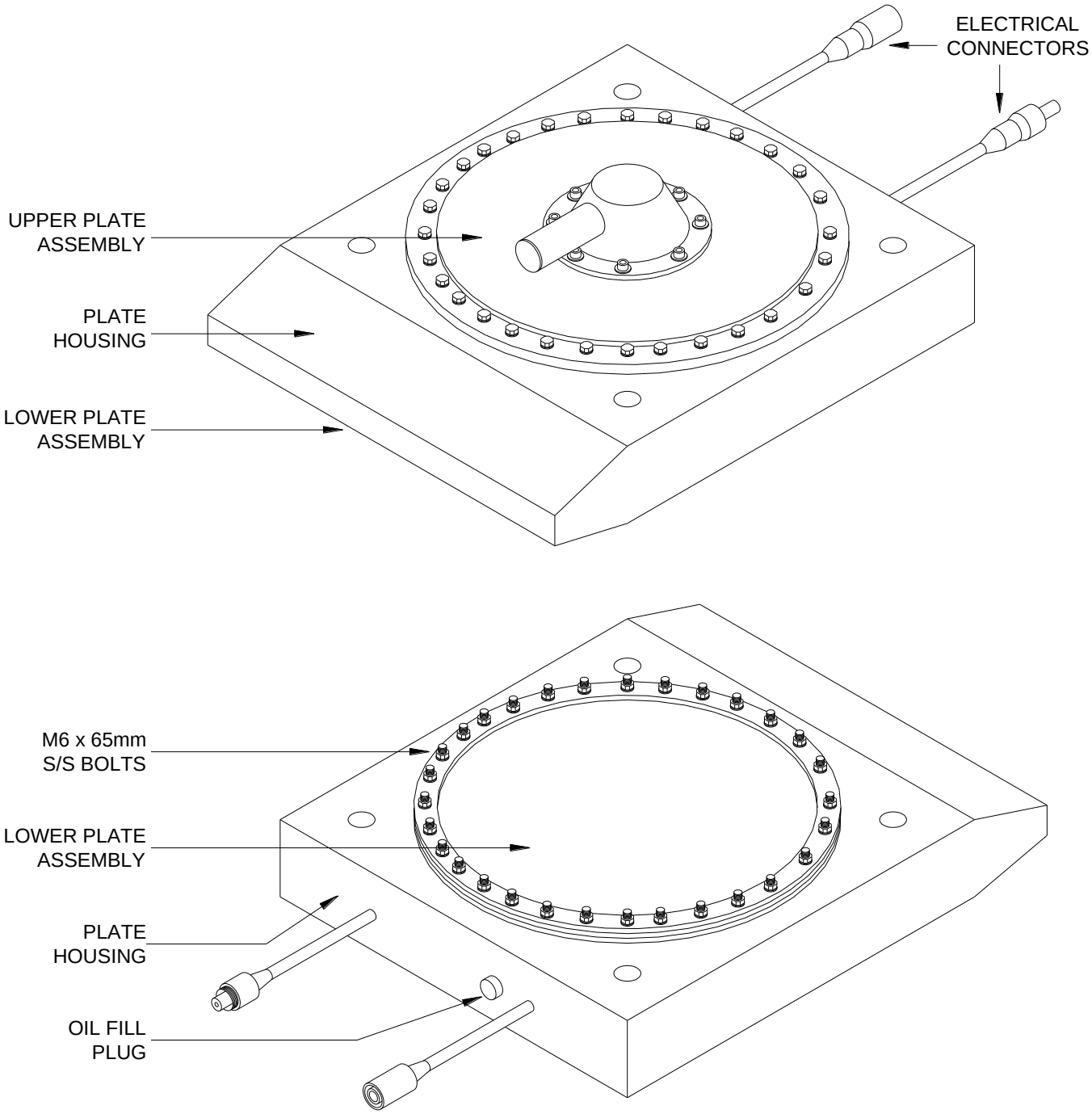
The housing is manufactured from plastic and contains the encapsulated electromagnetic coil along with electrical connections. When assembled the housing is oil filled this allows the heat generated by the coil to be dissipated.

Lower Plate Assembly

The main components of the lower plate assembly are the diaphragm plate assembly and the dampers – these control the deflection of the diaphragm and hence the repeatability of the source.

Note the AA301 boomer plate is a variant of the AA300 by using
RMK connectors instead of Joy Plugs.

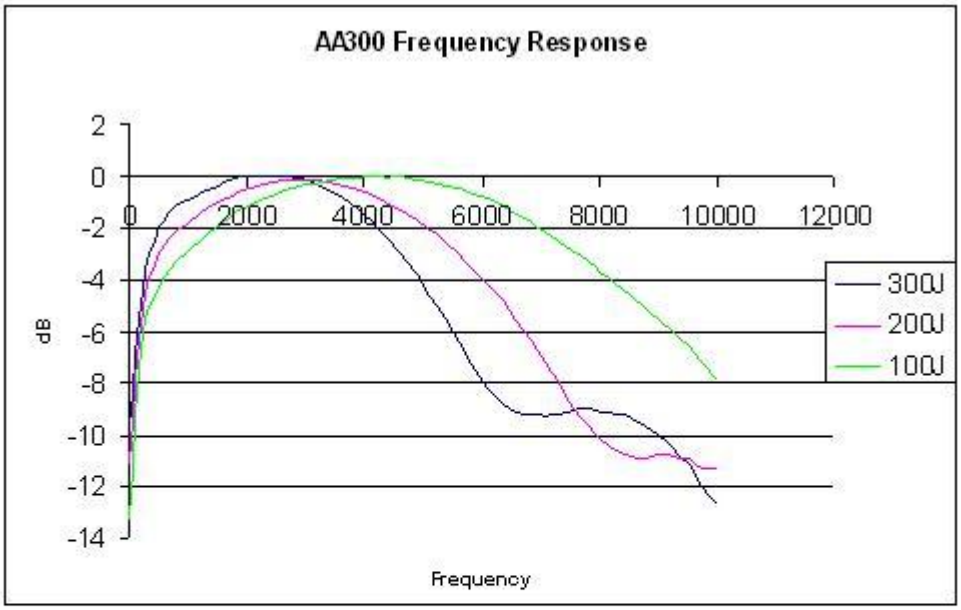
General Diagram



3. Theory of Operation

The transducer consists of an electrical coil, which is magnetically coupled to the plate (metallic disc) situated behind a rubber diaphragm. Energy contained in the electrical storage capacitors in the *CSP* unit is discharged into the Boomer plate coil. This creates a mechanical response on the diaphragm plate due to eddy currents on the plate. The resultant acoustic pressure pulse is broad spectrum in nature. The Acoustic Pulse shape and reverberation is controlled by damping springs.

The AA300 is oil filled to enable excess heat to be dissipated into the water efficiently. A reservoir is fitted to upper plate this allows the oil to expand and contract due to temperature variations.



4. Deployment / Operation

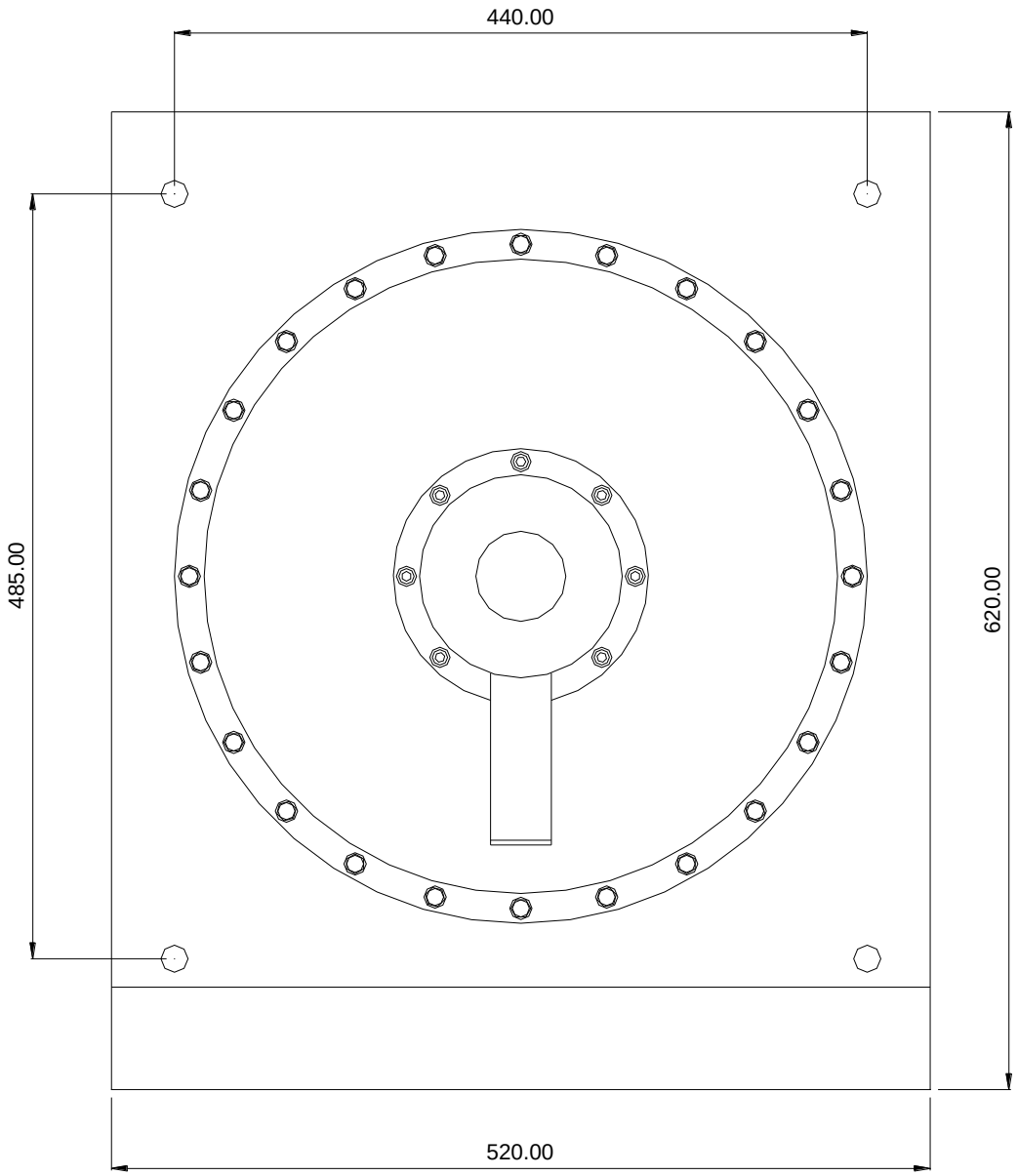
- The Boomer plate has been designed to be mounted on the CAT200, our lightweight catamaran. This has been specifically designed for this application.

- Rubber vibration isolators should be used to mount the Boomer plate to the catamaran framework. When installed correctly on the catamaran, the Boomer plate diaphragm should sit in the water at a depth of roughly 15cm. The catamaran should be adjusted to achieve this if required.
- Two towing ropes should be secured to the catamaran using two stainless shackles on the two points (see diagram). These towropes can provide a degree of steerage by adjusting the tension on each rope. Other adjustments include altering the towing point position (fore and aft) to increase stability of the catamaran. Note: No stress should be applied to the electrical connections whilst the unit is undertow as this may cause failure during operation.
- Ensure that the CSP power source is switched off and isolated before connecting the cabling or Boomer plate. Check that all power cables are in good mechanical condition and are fit for purpose before use (this includes the mains power supply lead and earth cable).

  Note: The black cables attached to the boomer plate connectors are rated at 600 Volts continuous rated load (as stated by the manufacturer on the cable) and 4KV for transient voltage applications.
- Tape all Boomer cable connections together with self-amalgamating tape to prevent the connections becoming separated if locking collars are not available. For correct cable connector type see specification section of this manual.
- The catamaran itself does not require an earth cable. However, the vessel pulling the catamaran should have the CSP unit earthed to the ship and the ship should be earthed to the sea. This should be at least 10mm². A reliable sea earth can be achieved by using a length of 10mm² copper cable with 1m stripped bare and immersed in seawater. The cable will need to be weighted to ensure constant contact with the seawater.
- A quick sea trial should be undertaken to check the floatation characteristics of the catamaran underway at roughly 2-3 Knots. If this proves successful, the unit should be checked for electrical continuity before power is supplied to the boomer system.
- Do not operate the boomer system until the sound source is fully deployed off the ship and avoid turning sharply (confined areas), which would allow the catamaran to come close in to the vessel.

Always operate the system using a reliable earth bond to the ship and the sea.

Physical Dimensions



FRONT

5. Maintenance Procedures

Inspection Intervals

Pre-Deployment:

- The recommended interval for a visual inspection is on every deployment of the plate.

Bi-annual:

- It is recommended that the plate is pulse tested to verify operation.

Annual:

- It is recommended that the plate is pulse tested and maintained annually.

Inspection

Visual Inspection (Pre Deployment)

- Check condition of diaphragm.
- Check condition of electrical connectors.
- Check for signs of excessive oil loss on external seals. If excessive, check oil level.
- Check for mechanical damage / insecure fastenings.
- Ensure that the plate securely mounted in its catamaran and anti-vibration mounts are in good condition.

Bi Annual Inspection

- Perform pulse test verification.
- Check condition of diaphragm.
- Check condition of electrical connectors.
- Check for signs of excessive oil loss on external seals. If excessive check oil level.
- Check for mechanical damage / insecure fastenings.
- Plate securely mounted in catamaran and anti-vibration mounts in good condition.

Annual Inspection

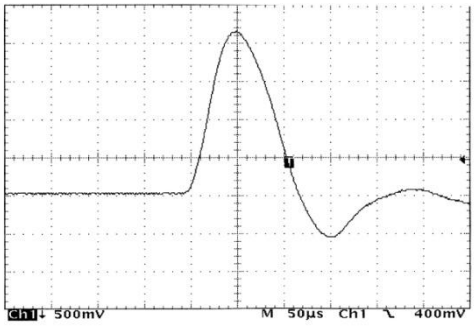
- Perform pulse test verification.
- Consider replacing damper spring assemblies.
- Check condition of diaphragm.
- Check oil level. Place plate on end and open oil fill plug and squeeze bladder. Oil level should be approx half way up thread with no air bubbles present.
- Check condition of electrical connectors. Consider replacement.
- Check for mechanical damage / insecure fastenings.
- Plate securely mounted in catamaran and anti-vibration mounts in good condition.

6. Product Recycling / Disposal

Within the EU all electronic components and batteries must be taken for separate collection at the end of their working life under EU WEEE directives. Applied Acoustics as a manufacturer within the EU will responsibly dispose of any returned end of life Applied Acoustics components / batteries through a registered WEEE scheme. In order to prevent uncontrolled waste disposal and promote re-cycling please return any end of life Applied Acoustic components postage paid by sender to our UK head office. Please contact Tech Support for a RMA number prior to shipping.

7. Pulse Testing

- The minimum distance between the boomer plate and receiving hydrophone should be 1 metre.
- The plate should be just below the water (15cm is a good starting point).Please note that the pulse shape will change during an initial 'warm up' period. Ensure that the plate is not over driven – especially in still waters as water flow is required for cooling. See specifications elsewhere in the manual.
- Use a storage oscilloscope synchronised to the trigger pulse which is operating the CSP unit. The signal from the receiving hydrophone may be observed a short while after the trigger pulse. This time delay will be (0.5 mS +Td) where Td is the time delay corresponding to the distance between the boomer plate and the hydrophone. The 0.5 mS delay in inherent in all CSP units.
- A calibrated hydrophone should be used to verify source level else the test will only verify functionality of the source.
- See below for typical pulse signature.



8. Analysis of Pulse

- The pulse should have no kinks or spikes present on either rising or falling edges.
- The positive amplitude should be greater than the negative by an approximate ratio of 2:1.
- The total pulse width should be <0.5mSec.(Typically 0.2mSec)
- Any reverberations should be <10% of the initial V peak to peak.
- Source level can be calculated by:

$$\text{Source Level} = \frac{\text{V peak to peak X Distance apart (1M)}}{\text{Hydrophone Sensitivity (V/Bar)}}$$

N.B. Hydrophone sensitivity is normally quoted in uV/Pa to convert into V/Bar simply divide uV/Pa by 100,000: as 100,000Pa = 1Bar. E.G. A hydrophone with a sensitivity of 50.2uV/Pa = 5.02V/Bar.

9. Fault Identification And Rectification

The AA300 Boomer is a unique design on which the operator can perform general maintenance and undertake repairs thereby extending its field life.

Loss of data quality and electrical failure are the main faults that occur as a result of mechanical damage or component failure. These are generally identified by inspection, whilst conducting pulse signature verification or whilst acquiring sub bottom data.

Periodic replacement of the damper assembly and diaphragm are considered to be part of the maintenance procedure. Exact timing of servicing cannot be predicted as it is dependent on operational conditions.

Damper Assembly Failure

Symptoms

- Distortion of downward pulse after initial rise.
- Excessive reverberation of pulse.
- Cracked or broken damper ring.
- Poor data quality- analysis of first return.

Possible Causes

- Excessive power discharge /repetition.
- Mechanical damage
- Maintenance period elapsed.
- Mechanical damage

Solution

- Following the assembly procedures replace the damper assembly and test.

Coil Assembly Failure

Symptoms

- Drop in output power, this can be seen in data acquisition with a reduction of penetration / resolution.
- Poor response of pulse signature verification – dramatic reduction in source level.
- Open circuit or short circuit when measured with a digital volt meter set to resistance.

Possible Causes

- Excessive power discharge /repetition.
- Mechanical damage
- Mechanical damage

Solution

- Following the assembly procedures replace the coil assembly and test.

Electrical Connection (Joy Plugs/RMK) Failure

Symptoms

- Burn out or open circuit connections – resulting in dramatic reduction of source power.
- Loss of high frequency component of data as source is effectively a sparker.

Possible Causes

- Connections not cleaned or worn.
- Connections not secured by either locking collar or tape.
- Mechanical Failure.

Solution

- Following the assembly procedures replace the 'joy plugs' and test.
- Splice new connectors inline using suitable insulators and sealants.

Diaphragm Plate Assembly Failure

Symptoms

- Distortion of pulse after initial rise.
- Excessive reverberation of pulse.
- Loose or damaged diaphragm.
- Poor data quality- analysis of first return.

Possible Causes

- Excessive power discharge / repetition.
- Mechanical damage
- Maintenance period elapsed.
- Mechanical damage

Solution

- Following the assembly procedures replace the diaphragm assembly and test.

Loss of Oil from Housing

Symptoms

- Plate temperature excessive resulting in
- Poor pulse signature resulting in reduction in data quality.
- Water ingress resulting in coil failure and possible power supply damage.

Possible Causes

- Mechanical damage.
- Maintenance period elapsed.
- Over driving the plate in static water.
- Excessive power discharge / repetition.

Solution

- If no oil is present fully disassemble unit and inspect components for damage replacing seals and parts as required.

10. Assembly Procedures

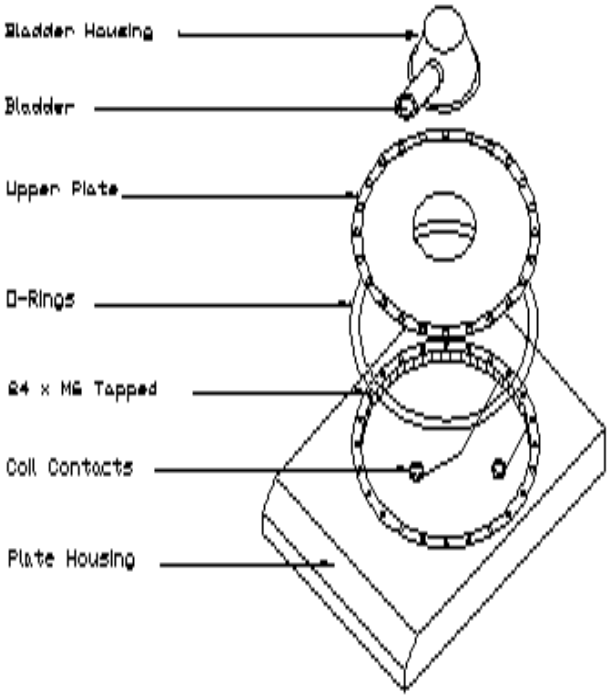
Prior to any maintenance being performed ensure that the power to the supply is isolated and the boomer plate is disconnected from the tow cable.

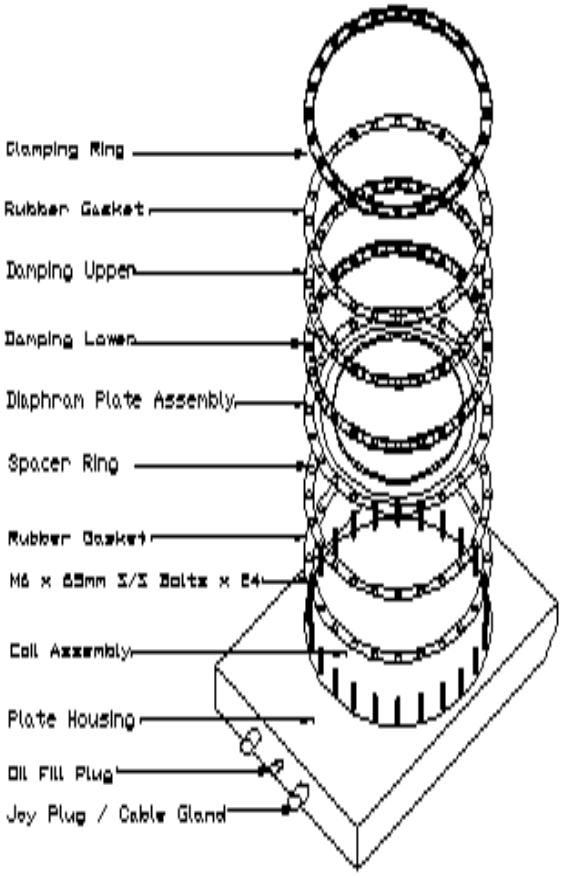
It is recommended that any maintenance is performed on a ‘clean’ bench to limit any contamination.

Disassembly

- Drain oil from the housing by removing the oil drain plug and pouring the oil into a clean container. Drain the excess oil in the bladder by removing the protection tube and squeezing the bladder.
- Rotate the plate back to the horizontal and replace the drain plug.
- The bladder housing can now be removed this is achieved by unscrewing the 8 M5 socket cap screws. With the housing removed any remaining oil can easily be drained into the container.(See below for bladder replacement)
- Flip the plate over to gain access to the lower assembly.
- Remove the 24 M6 Nyloc nuts and washers.
- Remove the clamping ring.
- Remove the rubber gasket.
- Remove the damper upper and lower.
- Remove the diaphragm plate
- Remove the spacer ring.
- Remove the rubber gasket.
- The coil assembly is now exposed but cannot be removed.
- Remove the 24 M6 S/S full nuts and washers.
- Position the plate onto its side allowing access to both the top and the bottom of the plate.
- Remove the 24 M6 bolts. The upper assembly can now be removed, ensuring that the o-ring seals are removed with care.
- Flip the plate over to expose the internal electrical connections.
- De-solder the connections to remove the coil assembly.
- The ‘pigtails’ can be removed by loosing cable glands.
- The plate is now fully disassembled.

Assembly Procedures





Assembly

- With new electrical pigtails fitted and held loose in the cable gland, flip the plate over and position the coil assembly into place. Using 2 M6 x 25mm bolts to hold the coil in place during assembly.
- Make the electrical connections, insulate and fit spiral wrap. Allow an amount of slack between the connection and the gland then tighten the gland.
- Ensuring that the o-ring grooves are clean, apply a liberal amount of o-lube to the o-rings and fit. Position the upper plate in place and fit using 24 M6 bolts. (NB remove previously fitted assembly bolts.)
- Flip plate over to expose coil assembly.
- Fit the 24 M6 S/S full nuts and washers, to secure the coil in place.
- Fit the rubber gasket.
- Fit the spacer ring.
- Fit the diaphragm plate
- Fit the damper upper and lower. NB Lower damper is the thinner and is fitted before the thicker upper damper.
- Fit the rubber gasket.
- Fit the clamping ring.
- Secure the assembly in place with 24 M6 Nyloc nuts and Washers. Tighten ‘bar’ tight to prevent leaks.
- Flip the plate over to gain access to the upper assembly
- Fit the oil drain plug.
- The housing can now be partially filled with oil prior to fitting the bladder assembly.
- The bladder housing can now be fitted using 8 M5 socket cap screws applying a small amount of thread lock. When fitting the bladder assembly compress the bladder to reduce the amount of air introduced into the housing.
- Stand the plate on end and remove the oil plug, bleed the plate of air by squeezing and releasing the bladder.
- Keeping the bladder compressed, top off the oil level so that the oil is approximately half up the threads of the oil fill plug.
- Refit the oil plug and tighten sealing the plate.
- Apply a small amount of thread lock to the bladder protection tube and fit.
- It is recommended that the signature of the plate is verified after any work has been performed.

Bladder Replacement

Equipment Required

- New Bladder & Protection Tube
- Oil
- O-Lube
- Hylomar Blue Thread Sealant
- Allen Keys 2mm & 4mm

Procedure

- Drain 1 litre of oil from the housing by placing the plate in the horizontal and removing the oil drain plug; collecting the oil in a clean container. Replace the drain plug.
- The bladder housing can now be removed this is achieved by unscrewing the 8 M5 socket cap screws. Unscrew the outer protection tube to remove screw under.
- Squeeze the remaining oil from the bladder into the container.
- From the underside of the housing, using a small Allen key, loosen the bladder. Then remove bladder. A new bladder can now be fitted.
- Apply a liberal amount of O-Lube to o-ring.
- Fit bladder to housing, do not over tighten when inserting by hand.
- Tighten bladder by using a small Allen key in the locking holes provided.
- Prior to refitting of bladder assembly the oil level can be topped up thru the top assembly.
- The bladder housing can now be fitted using 8 M5 socket cap screws applying a small amount of Hylomar blue. When fitting the bladder assembly compress the bladder to reduce the amount of air introduced into the housing.
- Stand the plate on end and remove the oil plug, bleed the plate of air by squeezing and releasing the bladder.
- Keeping the bladder compressed, top off the oil level so that the oil is approximately half up the threads of the oil fill plug.
- Refit the oil plug and tighten sealing the plate.
- Apply a small amount of thread lock to the bladder protection tube / cover and fit.

Damper Replacement

Equipment Required

- 10mm Ring Spanner
- 10mm Socket
- New spring assembly

Procedure

- Flip the plate over to gain access to the lower assembly, using 2 blocks to support the plate therefore preventing any damage to the bladder assembly.
- Remove the 24 M6 Nyloc nuts and washers, holding the bolt secure to prevent any oil leakage.
- Remove the clamping ring.
- Remove the rubber gasket.
- Remove the used damper upper and lower ring.
- Replace the damper upper and lower rings.
- Fit the rubber gasket.
- Fit the clamping ring.
- Secure the assembly in place with 24 M6 Nyloc nuts and washers.
- It is recommended that the signature of the plate is verified after any work has been performed.

Oil Top-up Procedure

Refer to Material Safety Data Sheet supplied with the mineral oil to ensure familiarity with the substance (Appendix 1).

1) Ensure procedure is carried out in a clean and dry work area. Position the plate in work area with the bladder housing on top (fig 1).

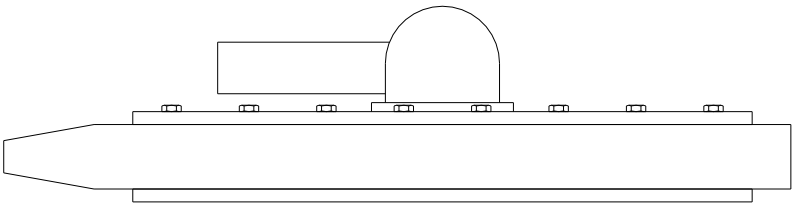


Fig 1

2) Unscrew (anti-clockwise) the end-cap of the bladder protective cover to expose the end of the bladder.

3) Unscrew (anti-clockwise) and remove the bladder protective cover whilst ensuring that the bladder does not move during this process.

4) Rotate position of plate so the bladder is facing downwards (fig 2). Ensure the plate is securely held. Use a 19mm open-ended spanner to remove the filler bung located between the power input cable glands.

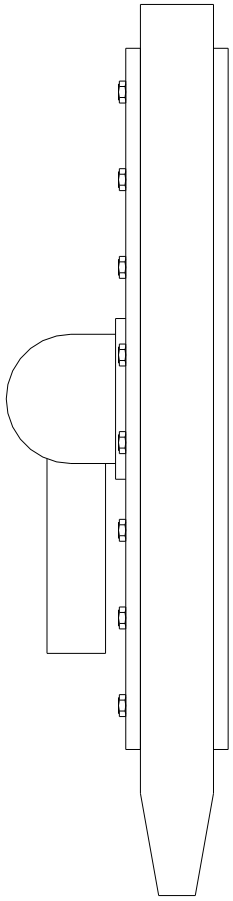


Fig 2

5) Gently squeeze the bladder until it is completely flat evacuating as much air as possible. Using a suitable funnel, pour a small quantity of oil through the filler hole whilst slowly releasing hold of the bladder. The oil will be drawn in slowly with minimal amounts of air. Re-apply the hold on the bladder until it is completely flat again. Repeat filling process until the bladder can be held flat (with no air inside) and the oil level reaches the top of filler hole. Maintaining the hold on the bladder, re-fit and tighten filler bung using the 19mm open-ended spanner.

Note : When the boomer plate and oil becomes warm during operation, the bladder expands with the oil acting as a reservoir.

6) Rotate position of plate on work area (fig 1) and re-assemble bladder protective cover over the bladder ensuring the bladder does not move during this process. Screw end-cap on and wipe clean any excess oil from the plate and work area.

11. Technical Specifications AA300 Plate

Mechanical:

Boomer plate size : 52 X 60 cm depth 15 cm (including diaphragm cover)

Weight in air : 33.5 kg
Weight in water : 20 kg

Depth rating : 10 metres

Hole fixing centres : 40.6 cm

Oil Quantity : 4.5Litre (approx)

Connector types :Joy plug male and female (AA300)
:RMK male and female (AA301)

Dynamic:

Recommended duty cycle : 350 Joule @ 2.8 PPS
: 300 Joule @ 3.3 PPS
: 200 Joule @ 5 PPS
: 100 Joule @ at 6 PPS

Static operation duty cycle : 600 Joules per second

PPS = Pulse per Second

(Note the 6 pps maximum is governed by the CSP maximum repetition rate)
The settings apply to seawater temperatures up to a maximum of 25 deg C.

Seawater temperatures above 25 deg C, de-rate the power input by 25%.

Seawater temperatures above 30 deg C de-rate the power input by 50%.

Maximum input voltage : 4000 volts
Male connector input : Positive
Female connector (ground) : Negative

Warning for static (non towed operation), reduce maximum energy input by a factor of 50% after 30 minutes of continuous operation.

Source Level at 200J is 216 dB at 1m acoustic pressure (re 1 μPa)
(approx 0.5bar metre), although it will vary with cable type/length.

Typical pulse length : 160 μS
Reverberation time : < 1/10 X initial pulse

Specifications can change without notice and are only correct at time of going to press

12. Appendix

DOW CORNING

PRODUCT SAFETY DATA SHEET

According to article 31 and Annex II of the EU REACH Regulation

Version: 1.8
Revision Date: 02.02.2009

DOW CORNING(R) 561 SILICONE TRANSFORMER LIQUID

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Trade name	:	DOW CORNING(R) 561 SILICONE TRANSFORMER LIQUID	
Company	:	Dow Corning S.A. rue Jules Bordet - Parc Industriel - Zone C B-7180 Seneffe Belgium	
Service	:	Dow Corning Central Europe	Tel: +49 6112371 Fax: +49 611237609
		Dow Corning Northern Europe	Tel: +44 1676528000 Fax: +44 1676528001
		Dow Corning Southern Europe	Tel: +33 472841360 Fax: +33 472841379
Emergency Phone Number	:	Dow Corning (Barry U.K. 24h) Dow Corning (Wiesbaden 24h) Dow Corning (Seneffe 24h)	Tel: +44 1446732350 Tel: +49 61122158 Tel: +32 64 888240
E-mail address (Safety Data Sheet)	:	sdseu@dowcorning.com	
Use of the substance/preparation	:	Electrical and electronic applications Insulating agents	

2. HAZARDS IDENTIFICATION

Not hazardous according to article 31 and Annex II of the EU REACH Regulation and its subsequent amendments.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical characterization: Silicone

Hazardous Ingredients:

Name	CAS-No.	EINECS/ ELINCS No.	Conc. (% w/w)	Classification
No hazardous ingredients.				

4. FIRST AID MEASURES

On contact with eyes	:	No first aid should be needed.
On skin contact	:	No first aid should be needed.
If inhaled	:	No first aid should be needed.
On ingestion	:	No first aid should be needed.

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DOW CORNING(R) 561 SILICONE TRANSFORMER LIQUID

5. FIRE FIGHTING MEASURES

Suitable extinguishing media	:	On large fires use dry chemical, foam or water spray (fog). On small fires use carbon dioxide (CO_2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Unsuitable extinguishing media	:	None known.
Hazards during fire fighting	:	None known.
Special protective equipment/procedures	:	A self-contained respirator and protective clothing should be worn. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Hazardous Combustion Products	:	Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Silica. Carbon oxides and traces of incompletely burned carbon compounds. Formaldehyde.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Wear proper protective equipment.
Precautions to protect the environment	:	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth or other appropriate barriers.
Methods for cleaning up	:	Determine the need to evacuate or isolate the area according to your local emergency plan. Very large spills should be contained by bunding, etc... procedures. Mop, wipe or soak up with absorbent material and place in a container with a lid. The spilled product produces an extremely slippery surface.

7. HANDLING AND STORAGE

Advice on safe handling	:	Avoid eye contact. General ventilation is recommended.
Advice on storage	:	Do not store with oxidizing agents.
Specific uses	:	Refer to technical data sheet available on request.
Unsuitable packaging materials	:	None known.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls	:	Ventilation : Refer to Section 7

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Exposure controls for hazardous components

Name	CAS-No.	Exposure Limits

None of the components have assigned exposure limits.

Personal protection equipment

Respiratory protection	:	Respiratory protection is not normally required.
Hand protection	:	Gloves are not normally required.
Eye protection	:	Safety glasses should be worn.
Skin protection	:	Protective equipment is not normally necessary.
Hygiene measures	:	Exercise good industrial hygiene practice. Wash after handling, especially before eating, drinking or smoking.
Environmental exposure controls	:	Refer to section 6 and 12.
Additional information	:	These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions. For further information regarding the use of silicones / organic oils in consumer aerosol applications, please refer to the guidance document regarding the use of these types of materials in consumer aerosol applications that has been developed by the silicone industry (www.SEHSC.com) or contact the Dow Corning customer service group.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form: Liquid **Colour:** Colorless **Odour:** Characteristic odour

Important health, safety and environmental information

Boiling point/range	:	> 65 °C
Flash point	:	> 101 °C (Closed Cup)
Explosive properties	:	No
Specific Gravity	:	0.96
Viscosity	:	50 cSt at 25°C.
Oxidizing properties	:	No

The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.

10. STABILITY AND REACTIVITY

DOW CORNING

PRODUCT SAFETY DATA SHEET

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DOW CORNING(R) 561 SILICONE TRANSFORMER LIQUID

Packaging disposal	:	Dispose of in accordance with local regulations. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

14. TRANSPORT INFORMATION

Road / Rail (ADR/RID)

Not subject to ADR/RID.

Sea transport (IMDG)

Not subject to IMDG code.

Air transport (IATA)

Not subject to IATA regulations.

15. REGULATORY INFORMATION

Labelling according to EEC Directive

No special packaging or labelling requirements.

National legislation / regulations

Ozone depleting chemicals	:	No ozone depleting chemicals are present or used in manufacture.

Status

EINECS	:	All ingredients listed, exempt or notified (ELINCS).
TSCA	:	All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.
AICS	:	All ingredients listed, exempt or notified.
IECSC	:	All ingredients listed or exempt.
MITI	:	All ingredients listed, exempt or notified.
KECL	:	All ingredients listed, exempt or notified.
PICCS	:	All ingredients listed, exempt or notified.
DSL	:	All ingredients listed or exempt.

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Revision Date: 02.02.2009

DOW CORNING(R) 561 SILICONE TRANSFORMER LIQUID

Stability	:	Stable under normal usage conditions.
Conditions to avoid	:	None established.
Materials to avoid	:	Can react with strong oxidising agents.
Hazardous decomposition products	:	Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Silica. Carbon oxides and traces of incompletely burned carbon compounds. Formaldehyde.

11. TOXICOLOGICAL INFORMATION

On contact with eyes	:	May cause temporary discomfort.
On skin contact	:	No adverse effects are normally expected.
If inhaled	:	No adverse effects are normally expected.
On ingestion	:	No adverse effects are normally expected.

[1] Based on product test data.
[2] Based on test data from similar products.

12. ECOLOGICAL INFORMATION

Environmental fate and distribution

Siloxanes are removed from water by sedimentation or binding to sewage sludge. In soil, siloxanes are degraded.

Ecotoxicity effects

No adverse effects on aquatic organisms.

Bioaccumulation : No bioaccumulation potential.

Fate and effects in waste water treatment plants

Removed > 90% by binding onto sewage sludge. No adverse effects on bacteria. The siloxanes in this product do not contribute to the BOD.

Additional environmental information

Additional environmental information on the silicone component is available on request.

13. DISPOSAL CONSIDERATIONS

Product disposal	:	Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

DOW CORNING

PRODUCT SAFETY DATA SHEET

According to article 31 and Annex II of the EU REACH Regulation

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16. OTHER INFORMATION

This product safety data sheet was prepared in compliance with article 31 and Annex II of the EU REACH Regulation as well as its relevant amendements, on the approximation of laws, regulations and administrative provisions relative to the classification, packaging and labelling of dangerous substances and preparations.

It is the responsibility of persons in receipt of this Product Safety Data Sheet to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces a formulation containing the Dow Corning product, it is the recipient's sole responsibility to ensure the transfer of all relevant information from the Dow Corning Product Safety Data Sheet to their own Product Safety Data Sheet in compliance with article 31 and Annex II of the EU REACH Regulation.

All information and instructions provided in this Safety Data Sheet (SDS) are based on the current state of scientific and technical knowledge at the date indicated on the present SDS. Dow Corning shall not be held responsible for any defect in the product covered by this SDS , should the existence of such defect not be detectable considering the current state of scientific and technical knowledge.

As stated above, this Safety Data Sheet has been prepared in compliance with applicable European law. If you purchase this material outside Europe, where compliance laws may differ, you should receive from your local Dow Corning supplier a SDS applicable to the country in which the product is sold and intended to be used. Please note that the appearance and content of the SDS may vary - even for the same product - between different countries, reflecting the different compliance requirements. Should you have any question, please refer to your local Dow Corning supplier.