

Manual

Optional exhaust smoke module for Benedini Soundunits (smoke oil based)



Summary

The electronic smoke generator module is designed to compliment the existing and any new range of digital Benedini sound units in most RC land vehicles. It provides for exhaust smoke to be generated both proportionally and synchronised to the speed of the vehicle and the engine sound emitted by the Sound Unit. The smoke controller has galvanic isolation from the sound module and the receiver.

The method of operation is for smoke fluid to be heated by the heater elements (the smokers) and the smoke produced blown out of the smoke accumulation reservoir by the fan in a volume dictated by the speed of the vehicles motors/engine sound module. The system although simple in its operation is totally reliable and effective and produces a scale effect that will enhance any models appearance.

The complete unit consists of a speed controllable fan, a smoke reservoir, a control unit and up to a maximum of four smoke elements (smokers) dependant on the scale of the vehicle it is fitted to that are operated and that are switched on and off electronically according to the speed of the motor(s).

System operation

When the engine sound is not switched on or the sound unit is switched off after use, no smoke will leave the exhaust.

During starting or accelerating a large volume of smoke will be produced. When the model is moving, all heating elements are active and the fan speed is electronically adjusted proportionally to the model speed to deliver a realistic volume of exhaust smoke.

Operating requirements and user personal advice

- To ensure the unit always operates correctly ensure the smoke fluid reservoir is always sufficiently full for the intended period of operation. The exact level to be determined by the purchaser. Should the fluid be exhausted during operation, it should be refilled as soon as possible. The heating elements are to a degree protected against overheating by the fan but running for extended period in this condition will cause the premature failing of the heating elements.
- Various different smoke effects can be achieved by experimenting with the exhaust pipe(s) and their fittings. To increase the volume and pressure of smoke a reduction in the final pipe size on the scale exhaust pipe will provide for greater realism. The effect may not however be ideal for all models and the purchaser is advised to experiment until they are satisfied with the result.

Construction

The smoke system reservoir is delivered **as a kit** with the electronic control unit built and tested. Further items are provided that must be modified by the purchaser. As all applications and installations will vary in one form or another, it is not possible to have standard fittings.

The smoke reservoir consists of a transparent electronic housing. This provides a visual reference to the level of the smoke fluid and the internal functions of the smoker. Three different sizes of reservoir are available.

The smoke fluid reservoir and the fan must be mounted at the housing. Different drill sizes are necessary, for air inlet, smoke outlet, refilling tube and the electrical connections.

The housing can be sealed at the edges with normal tape or mastic if necessary.

The electrical connections are done via solder lugs mounted with screws at the inner and outer side of the smoker housing. The heating elements are soldered at the inner side and the connections to the controller are done with the outer lugs. The wiring for 12V or 24V operation is shown at the example housing.

A switch at the +12V supply of the heaters is strongly recommended.

This will allow for switching off the heaters before switching off the model. This will provide for the rapid cooling down the heaters and also, the remaining smoke will be blown out the reservoir and piping.

The construction of the housing can be complete in either a vertical or horizontal position dependant on the space available within the model. However, please ensure that the air inlet is always **either above or alongside the smoke elements** or the forced airflow will pass directly over the heater elements cooling and thereby not producing the desired volume of smoke.

The heater elements must be mounted in that way, that the glass tubes **DO NOT** touch the bottom of the ABS lower reservoir. The end of the refilling tube should reach just above the bottom of the fluid reservoir, approximately 5 mm. The level of the smoke fluid on filling must not be higher than the top of the glass heater element tubes.

The heating elements (the non clear glass parts) **MUST NEVER** be in contact with the smoke fluid. **DO NOT OVERFILL THE RESEVOIR.**

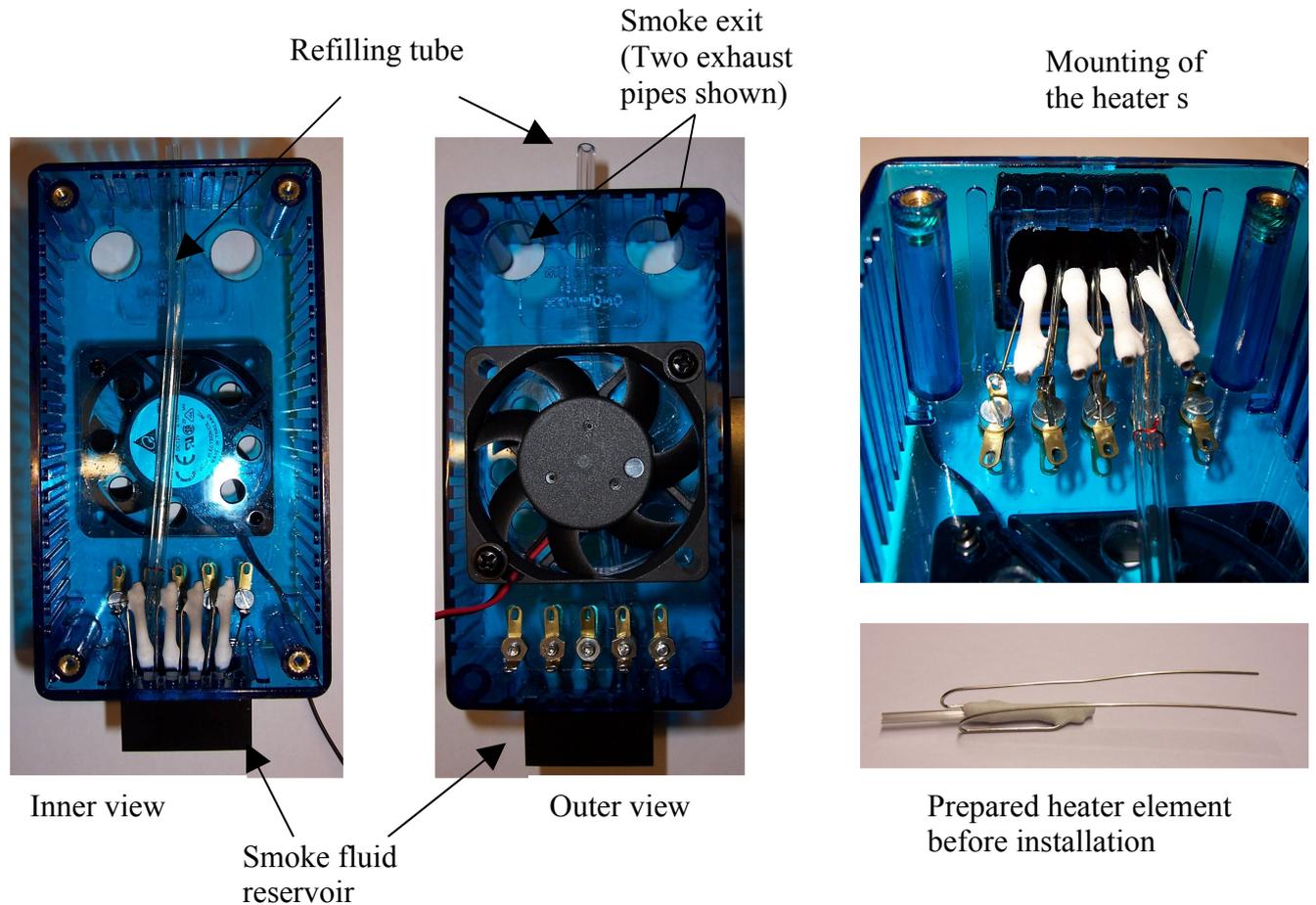
The heaters are very **sensitive to shock**, Care should be taken during installation and any rough handling avoided.

Common plastic tubes do all tube connections. The smoke outlet volume can be adjusted by experimenting with different whole diameter tubes for both the air intake and the exhaust smoke outlet pipe(s). The inner diameter of the pipes should be 10mm. A special sealing to the housing is not necessary if the outlet drillings are a little smaller than the tube diameter.

Operating advice.

As the smoke fluid is used up the fluid levels becomes lower than the end of the refilling tube. This then allows smoke to exit at the refilling inlet. This is in itself a visual indication that replenishing of the smoke fluid is necessary.

Example of a smoker housing



Three sizes of reservoir are available to meet most individual requirements. These sizes are:

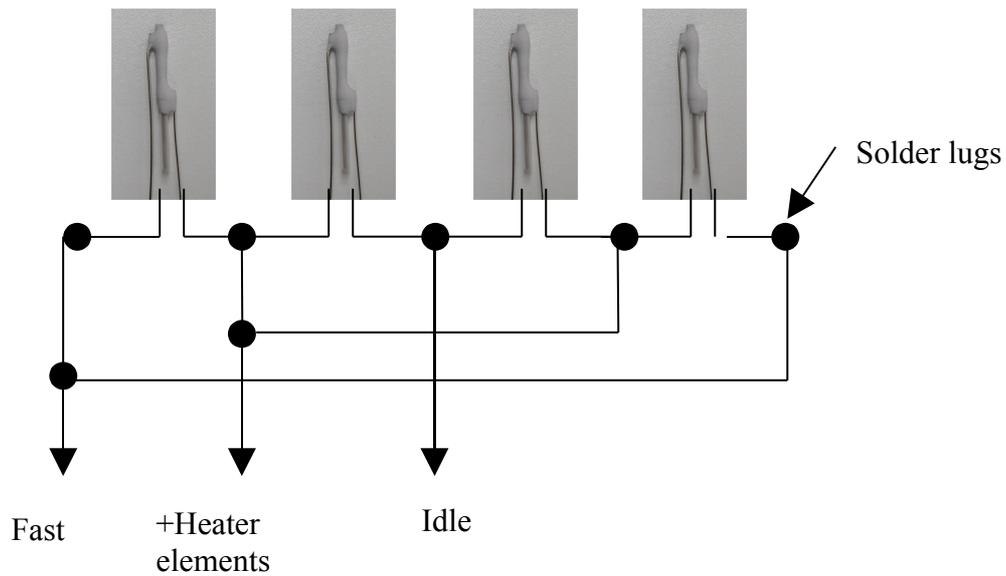
Large: 150 x 80 x 50 mm (5.9 x 3.2 x 2.0 inches)

Medium: 120 x 65 x 40 mm (4.8 x 2.6 x 1.6 inches)

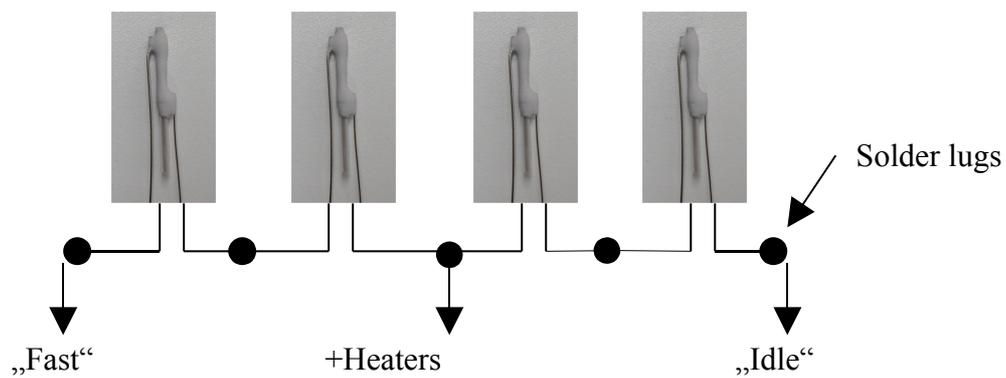
Small: 105 x 50 x 27 mm (4.2 x 2.0 x 1.1 inches)

The smoke fluid reservoir needs in addition about 20mm (0,8 inch) at one side of the housing. An itemed complete description of the constructing of a standard size reservoir is located at the end of these instructions.

Electrical wiring for 12V operation -> 2 x two heaters connected in parallel



Electrical wiring for 24V operation -> connected in series



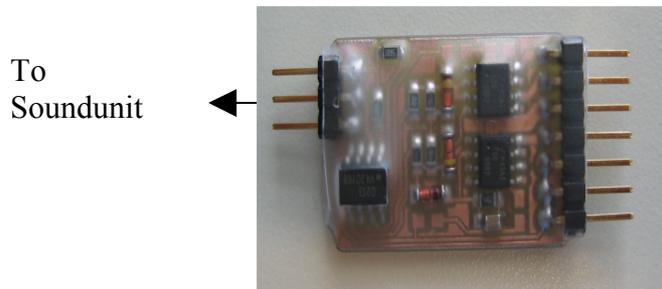
Example of using a plastic bottle as a smoker housing

From left to right:

- a. Single 'Smoker'. .31" x 1'57". (8x40mm)
- b. Reservoir. 2'75" x 5" x 12"
- c. Inner view of the reservoir screw lid with heating elements fitted. (70x130mm)



Controller connections

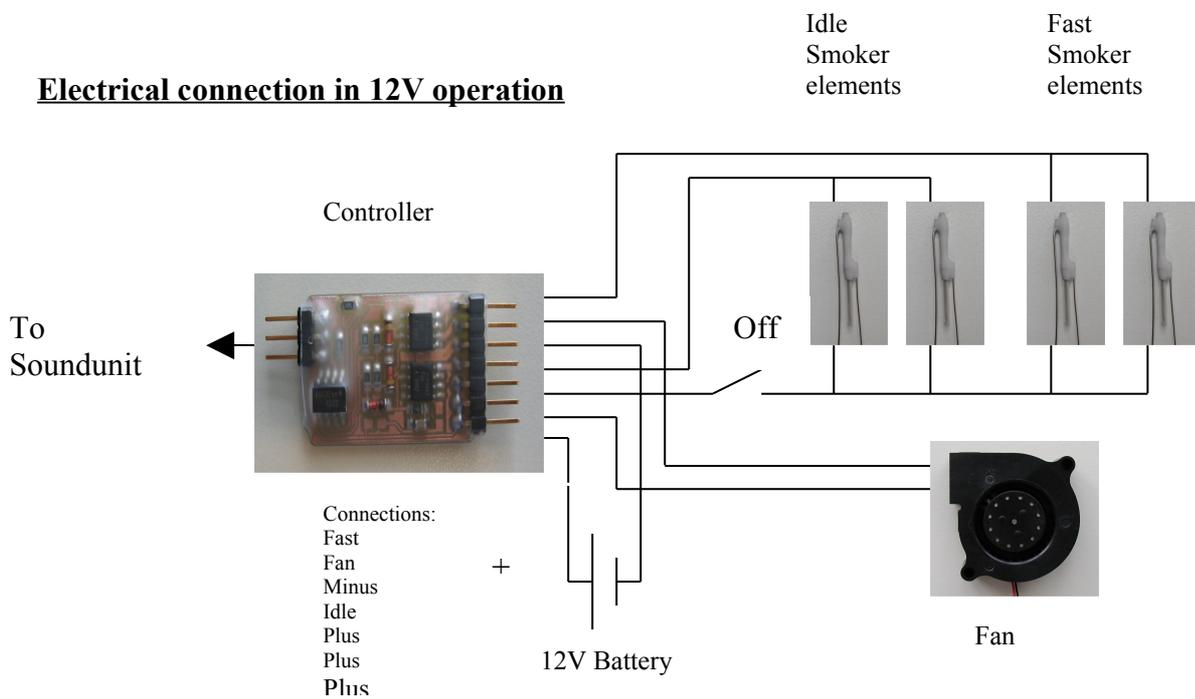


Connections from top to bottom:

- Fast. Smoke elements
- Fan
- Battery
- Idle Smoke elements
- + Smoke elements
- + Fan
- + Battery

Dimensions 35x25 mm (1.38 x 1 inches)

Electrical connection in 12V operation



Construction advice

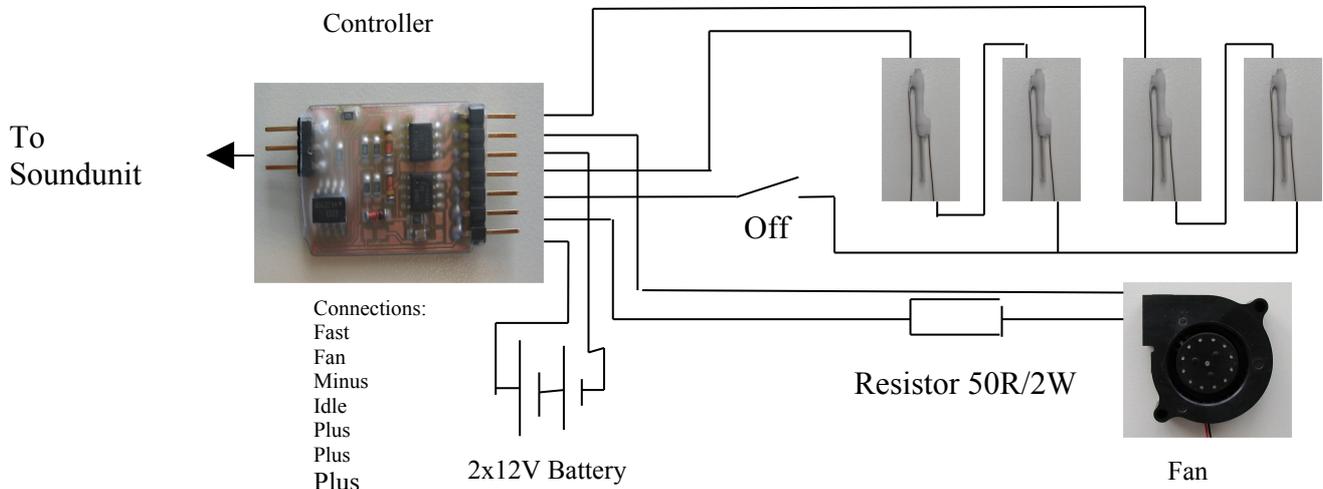
When the maximum of four heating elements are used, the fast and idle heating elements must be connected in **parallel** as illustrated the wiring diagram above.

Electrical connection in 24V operation

Electrical connection in 24V operation

„Idle“
Smokers

„Fast“
Smokers



User advice

As 24V operated models are normally large scale, the maximum of four heating elements should be used for authentic smoke production. In this case the idle and fast heating elements are connected in **series**.

N.B. A resistor of about 50 Ohms/2Watt must be added into the plus lead of the fan if operating at 24 volts.

NEVER OPERATE THE SMOKE EXHAUST MODULE WITHOUT SUFFICIENT SMOKE FLUID WITHIN THE RESERVOIR OVER A LONGER PERIOD. TO DO SO MAY CAUSE IRREPARABLE DAMAGE TO THE HEATERS AND WILL INVALIDATE ANY GUARANTEE OR WARRANTY.

Instruction for building the smoke reservoir`

The vertical means of building the smoke reservoir is shown in the following illustrations. The same general principals apply should you require to build the horizontal reservoir.

1. Tape the Top drill jig for the refilling tube on top of the housing and mark the drilling hole location.
2. Tape the Cover drill jig on the housing and mark the drilling hole locations.
N.B. If you need only one exhaust smoke outlet do not drill the optional second hole.
3. Tape the Bottom drill jig on the housing and mark the edge locations of the outbreak to the smoke fluid reservoir. Complete the marks to a rectangle.
4. Pre drill the hole for the refilling tube with a 2 mm drill.
5. Pre drill all holes in the cover with a 2 mm drill.
6. Drill out the outbreak to the smoke fluid reservoir. Use a file or abrasive paper to obtain straight edges.

7. Drill the hole for the refilling tube to 3.9 mm. The refilling tube must be leak proof. Do not drill too large a hole.

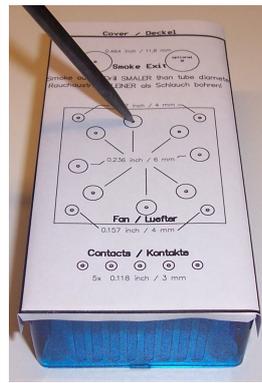
8. Drill all holes in the cover at the correct diameters as printed at the drilling template.

Important information.

- a) Do not drill the smoke outlet holes greater than 13.5 mm. Ensure a 'friction fit' of the outlet tube to ensure it is leak proof.
- b) If mounting the fan by self-tapping screws ensure that the correct pilot drill is used.
- c) The air intake can be increased by using larger intake holes than 6 mm. This will however reduce the volume of smoke output.



Step1



Step2



Step3



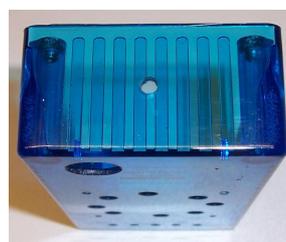
Step 4



Step 5



Step 6



Step 7



Step 8

9. Install the solder connections inside and outside of the housing. The lower side of the inner and outer solder connections must be angled.

10. Glue the smoke fluid reservoir at the bottom side of the housing. Ensure that the location of the lower ABS housing is correctly located and marked before removing the required area fully and firmly locating the ABS housing with an approved adhesive, e.g. Epoxy glue of similar. **DO NOT USE SUPER GLUE.**

11. Prepare the heating elements by **CAREFULLY** bending the wires upwards as shown in the previous photos. **USE MINIMUM FORCE AND AVOID** holding the body of the smoke elements in a vice or some other mechanical securing device.

12. Holding the wire close at the heater body very carefully and bend the open end of the wire. The total length between the end of the glass tube and the end of the wires should be approximately 31 mm (1.2 inches).

13. Install the heating elements by feeding the wires into the solder connections and solder them all to their correct locations. Ensure that a low wattage soldering iron is used and avoid too long a period in soldering, as the heat if excessive will cause the plastic case to distort. Make sure that the glass tubes of the heaters DO NOT touch the bottom of the smoke fluid reservoir when soldered and located.

14. Install the refilling tube through the hole on top of the housing into the fluid reservoir. The end of the tube should reach the bottom of the smoke fluid reservoir. Fix the tube securely on its length at for example, the internal solder connections. Install the fan.

15. Wire the outer solder connections for either 24 volt or 12 volt operation.

16. Securely fix the now completed reservoir in its location within your vehicle. A mechanical fixing of a metal strap or straps fixed by bolts or screws to the chassis of your model is/are strongly recommended.

17. The edges of the rear cover can be sealed by tape if necessary.



Step 9



Step 10



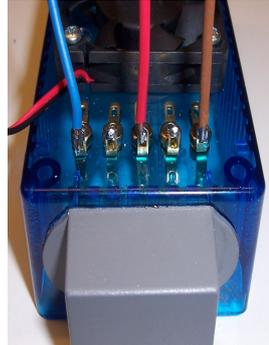
Step 11



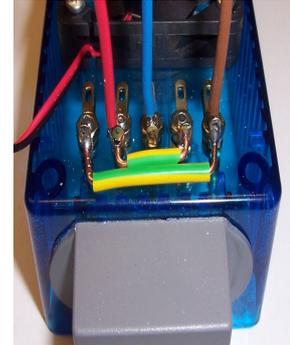
Step 12



Step 13



24V operation



12V operation

Smoke outlet

Refilling Tube



Fan
Red: +12V
Bk: Minus

+ Heaters

„Idle“
Heaters

„Fast“
Heaters

Total view, 12V operation

Please refer to the original manual in PDF format, available at www.benedini.de for detailed colour pictures

Super-Dampf-Erzeuger 8-12 V_~

speziell für Schiffe und andere Großmodelle

SEUTHE

Gebrauchsanleitung Nr. 500 mit Schlauchanschluß

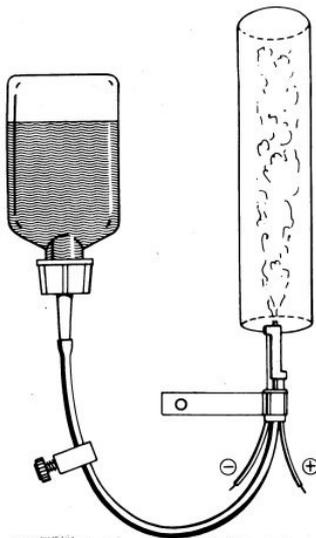


Abb. 1

Der Super-Dampf-Erzeuger Nr. 500 ist aufgrund seiner enormen Dampfmenge bestens für große Schiffs-, Gebäude und Fahrzeugmodelle geeignet. Da die Dampfdestillatzufuhr durch eine flexible Schlauchleitung erfolgt, kann der DE räumlich vom Tank getrennt werden. Die Größe des Tanks richtet sich nach der gewünschten Dampfdauer.

Der DE wird durch Überdruck mit Dampfdestillat versorgt. Die einfachste Einbaumöglichkeit zeigt die Abb. 1. Hierbei wird der Tank (z.B. beiliegende Flasche) höher als der DE eingebaut. Das Destillat fließt durch das natürliche Gefälle zum DE, wobei die Dampfmenge, durch die als Regulierventil fungierende Schlauchklemme eingestellt wird. Die Stromaufnahme des DE beträgt bei 12 V 600—700 mA. Am Tank ist für ausreichende Belüftung zu sorgen (z.B. Loch in den Flaschenboden schneiden, welches dann gleichzeitig zum Nachfüllen dienen kann). Als elegantere Lösung bietet sich an, den Tank tiefer als den DE anzubringen und diesen über eine Pumpe mit Destillat zu speisen (Abb. 2). Werden DE und Pumpe parallel geschaltet, kann der DE auch bei gefülltem Tank ohne Schließen des Regulierventils abgestellt werden. Außerdem läßt sich auch durch Ändern der Betriebsspannung die Dampfmenge regulieren. Die Schlauchleitungen zwischen Tank, Pumpe und DE müssen aus ölbeständigem Material sein. Wird der DE unterhalb des eigentlichen Schornsteins eingebaut und der Dampf unter Luftzufuhr zunächst durch ein Rohr geleitet, ergibt sich eine besonders dichte, gleichmäßige Dampfentwicklung.

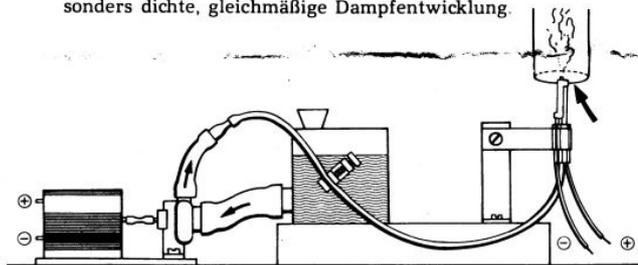


Abb. 2

M 1:2

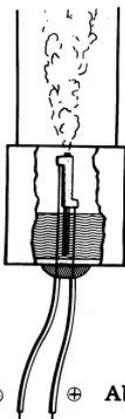


Abb. 3

Gebrauchsanleitung Nr. 501

zum Einbau in Vorratsbehälter

Der Dampf-Erzeuger kann direkt in den Vorratsbehälter eingebaut werden (Abb. 3). Hierzu werden die Anschlußdrähte des DE., die in diesem Fall auch als Träger dienen, durch 2 Bohrungen im Boden des Behälters nach außen geführt. Anschließend wird der DE senkrecht ausgerichtet und die Bohrungen mit einem 2-Komponenten-Bindemittel (Stabilit Express o.ä.) flüssigkeitsdicht vergossen. Bei einem Metallboden müssen die Drähte durch kleine Stücke Isolierschlauch isoliert werden. Während der Montage darf keinesfalls Gewalt angewendet werden. Der DE wird unterhalb des Schornsteins bzw. im Schornstein angebracht. Wenn der aufsteigende Dampf Luft mitziehen kann, wird die Dampfentwicklung intensiver. Dampfmenge und Dampfdestillatverbrauch richten sich nach der Betriebsspannung. Beim Füllen des Vorratsbehälters ist darauf zu achten, daß der DE. nur bis zur Hälfte im Destillat steht.

Achtung! Durch die optimale Auslegung des Heizwiderstandes bedingt, sollten die Super-Dampf-Erzeuger Nr. 500 und 501 nicht ohne Dampfdestillat betrieben werden. Eine mechanische Beanspruchung des Heizwiderstandes ist unbedingt zu vermeiden.

Voraussetzung für eine lange u. sichere Betriebsdauer ist die Verwendung der reinen u. wohlriechenden SEUTHE-Dampfdestillate.

Nr. 105: 50 ml Flasche
Nr. 106: 250 ml Flasche

US-Pat. No. 3 342 746

Operating Instruction Nr. 500 Super-Steam-Generator for Large Models 8-12 V \cong with hose junction.

Based on its enormous amount of steam the Super-Steam-Generator is in the best manner suitable for large ship-bodies and vehicle models. Since the supply of steam distillate follows through a flexible hose piping the Super-Steam-Generator can specially be separated from the tank. The size of the tank conforms to the desired duration of steam.

The Super-Steam-Generator is supplied by overpressure of steam distillate. Illustration Nr. 1 shows the most simple way for installation. Hereby the tank (for i. enclosed bottle) is installed higher than the Super-Steam-Generator. The distillate flows through the natural fall to the Super-Steam-Generator, whereby the amount of steam is tuned in by the hose clamp, acting a regulating valve. The power consumption of the Super-Steam-Generator amounts at 12 V \cong to 600-700 mA. Care must be given for sufficient ventilation on the tank. A more elegant solution to mount the tank lower than the Super-Steam-Generator, and to supply same with distillate by a pump (Illustration 2). Are the Super-Steam-Generator and pump switched parallel the Super-Steam-Generator can be turned off also with full tank without closing the regulating valve. Moreover, the amount of steam can be regulated by changing the operating voltage. The hose piping between tank, pump, and Super-Steam-Generator must consist of oilproof material. If the Super-Steam-Generator is installed below the real chimney, and the steam is first conducted among air supply through a pipe this results in an especially dense, proportionate development of steam.

Operating Instruction Nr. 501 Super-Steam-Generator for Large Models 8-12 V \cong for installation into Supply Container.

This Super-Steam-Generator can directly be installed into supply container (Illustration 3). Hereby the junction wires of the Super-Steam-Generator, serving in this case as girders also are conducted outside through 2 drill holes into the bottom of the container. Afterwards the Super-Steam-Generator is vertically aligned and the drill holes are densely cemented with a 2-Component Binding Agent (Stabilit Express or similar). Using a metal bottom the wires must be insulated by small pieces of insulation hose. Do not use force while mounting. The Super-Steam-Generator is installed below the chimney, respectively in the chimney. When the ascending steam can move along air the development of steam becomes more intensive. Amount of steam and consumption of steam distillate conforms to the operating voltage. When filling the supply container pay attention to the Super-Steam-Generator stands in the distillate only to the middle.

Attention! Conditional by the high efficiency of the heating resistance the Super-Steam-Generator Nr. 500 and 501 should not be operated without steam distillate. Mechanical loading of the heating resistance must absolutely be avoided.

No. 105: 50 ccm bottle

No. 106: 250 ccm bottle

Mode d'emploi du Super Générateur N° 500 (8-12 volts) équipé d'un conduit d'alimentation pour liquide fumigène et destiné aux grandes maquettes.

Le super générateur N° 500 est spécialement conçu pour équiper les grands bateaux, bâtiments et autres maquettes de grandes dimensions. Du fait que ce fumigène soit équipé d'un tuyau d'alimentation flexible, le réservoir à liquide peut être séparé. La capacité de ce réservoir est fonction de la durée de fonctionnement désirée.

Ce réservoir doit être monté en charge.

La méthode la plus simple (voir fig. 1) consiste à installer le réservoir plus haut que le générateur. Dans ce cas le liquide fumigène s'écoule par gravité, le débit étant réglé par une petite pince à vis qui étrangle plus ou moins le tuyau.

La consommation électrique sous 12 volts est de 600 à 700 mA.

Veiller à ce que le réservoir soit muni d'une entrée d'air.

Le montage du réservoir à un niveau plus bas que le générateur est évidemment une solution plus élégante, mais dans ce cas il faut prévoir une pompe d'alimentation en liquide fumigène (voir fig. 2). En cas d'alimentation électrique parallèle de la pompe et du fumigène, l'installation peut-être mise hors service sans la fermeture de la pince à vis. L'usage de la pompe permet également une régulation du débit en jouant sur la tension électrique. Les conduites assurant le passage du liquide doivent être en matériau oléoresistant. Si le générateur est implanté en amont de la cheminée et la fumée conduite par ventilation au travers d'un tuyau bien étanche, vous obtiendrez un dégagement de fumée d'une régularité parfaite.

Mode d'emploi du Super Générateur N° 501 (8-12 volts)

Montage prévu dans le réservoir à liquide. Spécialement conçu pour grandes maquettes.

Ce générateur peut-être installer directement dans le réservoir à liquide (voir fig. 3). Dans ce cas les fils de raccordement électrique, qui peuvent servir de supports, traverseront le fond du réservoir au travers de deux orifices.

Après raccordement de l'appareil fumigène, (veiller à la verticalité de celui-ci) les orifices de passage des fils seront bouchés à l'aide d'une colle à deux composants, p.ex. Stabilit-Express ou similaires. Veiller à l'isolation des conducteurs si le réservoir est en métal. Ne rien forcer en cours de montage.

Le générateur peut-être installé en dessous ou dans la cheminée. Si la fumée peut entraîner un courant d'air lors de son ascension, le dégagement sera plus intense.

La production de fumée et par conséquent la consommation de liquide peut-être réglée à l'aide de la tension électrique d'alimentation. Lors du remplissage du réservoir, le niveau du liquide ne peut en aucun cas dépasser la moitié générateur.

Attention! Les générateurs 500&501 ne peuvent être mis sous tension électrique sans alimentation en liquide fumigène. Eviter toute contrainte mécanique à la résistance électrique.

No 105; flacon de 50 cc

No 106; flacon de 250 cc

SEUTHE-SCHLEY GMBH Modellbahnzubehör
D-73107 Eschenbach · Frühlingstr. 15 · Tel. (07161) 41242



This equipment is marked with the recycling symbol. It means that at the end of the lifetime of the equipment you must dispose of it separately at an appropriate collection point and not place it in the normal domestic unsorted waste stream. (European Union only)

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