

Wallas Nautic 40D

Operator's Manual with Installation Guide

(Furnace for marine use only)



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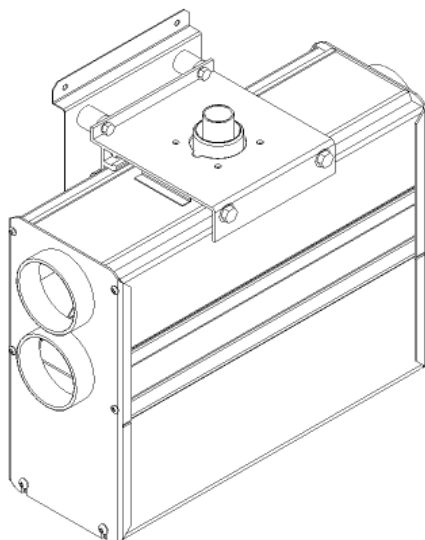
Operation

Nautic 40D is a marine diesel furnace with no open flame, intended for recreational use. Use as a live aboard product will mean more frequent servicing, not covered by warranty. The furnace extracts combustion air from the installation space through a slot in its base and blows the exhaust gases overboard. This process forces replenishment of damp cabin air with drier, oxygen rich air from outside. As the fuel burns, the released heat is transferred to the air circulating in the air ducts via heat exchanger. The furnace heating power is fully adjustable by way of a rheostat. The return and fresh makeup air is brought to the heat exchanger by way of inlet ducting. Thanks to this suction duct capability the furnace can also be installed in a diesel engine room. The furnace can also be used as a ventilator, circulating air in the boat without heating through the air ducts. This keeps the air fresh in the boat in hot weather. The heating capacity of the device is best suited to 30' – 42' boats. Control panel options include a Basic Control Panel with indicator lamps or a Digital Info Control Panel. The furnace is made entirely of marine grade materials.

Table 1: Technical details of furnace 40D.

TECHNICAL DETAILS

Fuel	Diesel #1,#2, kerosene, JP4, Klean Heat
Operating voltage	12 V DC
Fuel consumption	0.03 – 0.11 US gph
Heating capacity	1.3–4 kW (4,000 – 14,000 btu)
Heating air volume	132 cfm
Ventilation air volume	85 cfm
Power consumption	1.8 - 4.4 A running, 8 A for about 6 min at ignition.
Dimensions	15 1/4" x 12 1/8" x 5 1/2"
Weight	Approx. 22 lbs
Maximum permitted length of exhaust hose	13' (Ø 28 mm) See page 3
Maximum permitted length of fuel hose	26'
Maximum permitted length of warm air duct	26' x 3" ID
Maximum permitted length of return air duct	7' x 3" ID
Minimum area of the combustion air opening	16 square inches
Applicable exhaust through hull fittings	3468, 2467 and 2460+2069
Accessories	3004 Basic Control Panel, 3005 Info Control Panel



Package contents

- Furnace
- 1 pc Accessory Bag
- 4 m Power cord
- 4 m Fuel hose with filter and adapter kit
- 1 pc Mounting bracket
- 1 pc Damper kit

Contents of the accessory bag:

- 6 pcs Mounting bracket screw 5 x 16
- 2 pcs Mounting bolt M8 x 120
- 2 pcs Corrugated base plate M8
- 1 pc Hose clamp 20/32
- 4 pcs Air duct fixing clamp 60/80
- 1 pc Fuse box bag

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Mounting the device

Attach the furnace mounting bracket to the dampening plate (figure 2). Attach the dampening plate to the bulkhead (figure 3). Attach the furnace to the mounting piece by clicking the rails of the mounting piece to the grooves in the sides of the furnace (figure 4). Lock the furnace in place through its suspension loops with the two long mounting bolts (figure 5). The furnace can be fitted to the bracket with the outlets at either end.

Mounting the control panel

Control panels are attached to the wall with the enclosed screws (figure 6). If desired, it is possible to flush mount by removing the collar of the control panel, although this collar needs to be used on the Info Panel if the thermostatic feature is to be functional.

NOTE: This furnace is made for marine use at or near sea level. **Not for unattended use.**

Space Requirements

The furnace may be mounted either on a bulkhead or under the deck, and should be vertical when the boat is on an even keel. Although the furnace can withstand some tilting and large angles temporarily, the burner will not perform optimally if it is constantly at an angle.

The installation must maintain a minimum of 8 inches under the furnace to facilitate maintenance, otherwise removal of the unit will be necessary for maintenance.

To avoid galvanic corrosion, the furnace should be isolated from the metal framework of the boat.

Take into consideration that the standard length of the control panel harness is 20ft. A 33ft extension is also available.

Exhaust pipe

The longest permissible exhaust gas pipe is 13ft. Exhaust runs over 8' should not have more than 360 degrees of turns. Turns should be as long radius as the installation allows.

The exhaust through hull fitting may be installed into the hull, the transom or the deck, depending on fitting type, hull design and other factors. If a deck fitting is desired and heavy water on deck is expected, then a closeable deck fitting (2460) with an extension (2069) should be used. On heeling sailboat through hull applications, the through hull fitting should be installed as far aft as possible, preferably at the stern. Recommended distance from the through hull fitting to the surface of the water is at least 12 inches.

Exhaust gas is hot! The exhaust pipe and fittings must be insulated well and installed away from flammable materials. Air must be allowed to flow freely past either the through hull or deck fitting. Please contact Scan Marine for information.

Figure 2: Joining the mounting bracket and optional dampening plate. If purchased, the screws needed are in the auxiliary bag of the dampening plate.

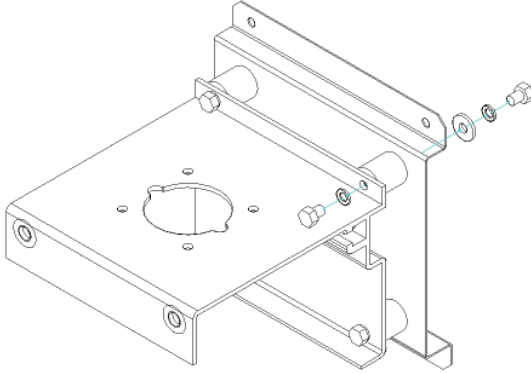


Figure 3: Attaching the mounting assembly to the bulkhead with four 5 x 16 standard screws.

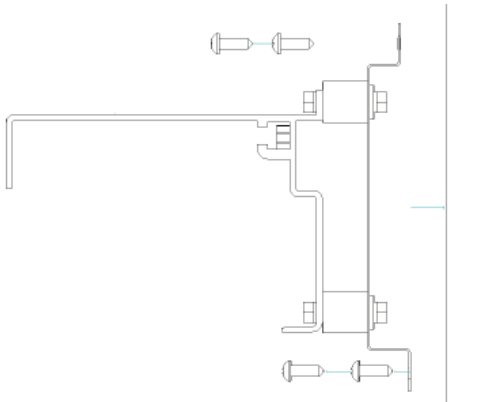


Figure 5: Locking the furnace in place with two M8 x 120 locking bolts.

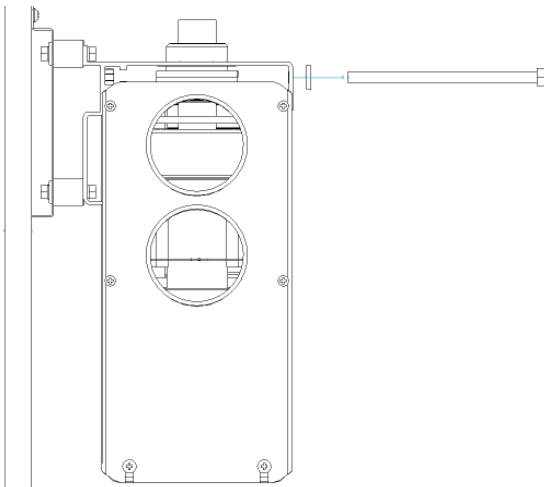
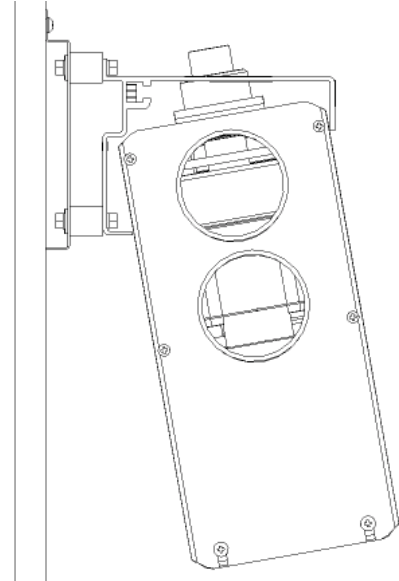
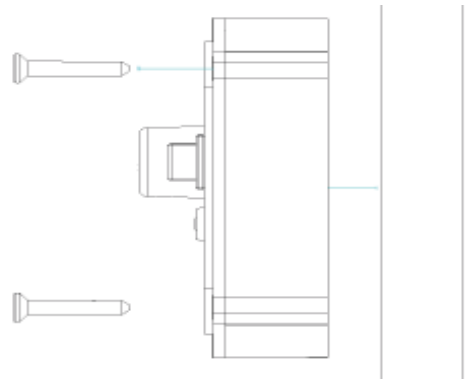


Figure 4: Attaching the furnace to the mounting bracket.



PLEASE NOTE: If the optional dampening plate is not purchased, simply attach the mounting bracket to a vertical wall or bulkhead. In either case, the furnace assembly can be installed into the bracket with the heat outlets pointing to the right or the left side relative to the bracket.

Figure 6: Attaching the control panel. Note: either the 3004 or 3005 can be mounted with or without the bezel shown here. 3005 panel must have the bezel fitted for thermostat to function properly.



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Make the connections for the furnace as shown in the figures below.

Figure 7:

- a) Tighten the exhaust gas pipe in place with a hose clamp. The exhaust gas pipe and the furnace connector must overlap at least 5 cm.
- b) Slide fiberglass sock back down over exhaust and hose clamp. Optionally, add clamp over sock.

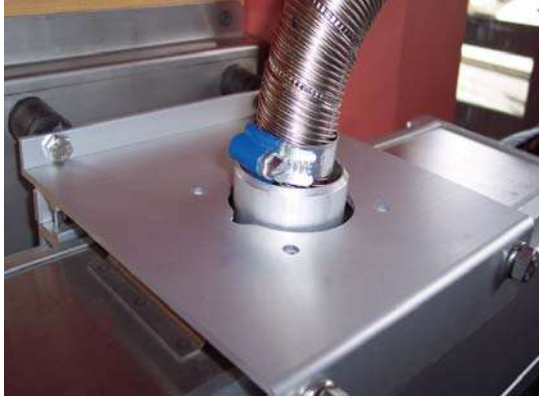
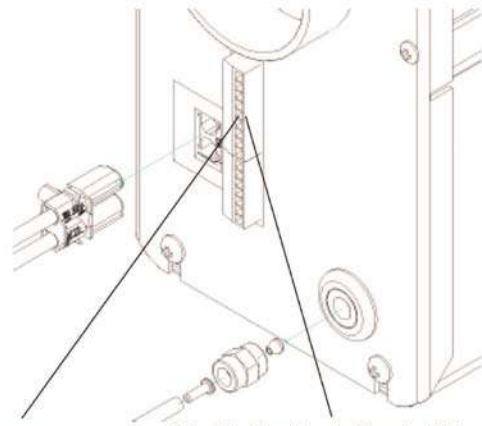
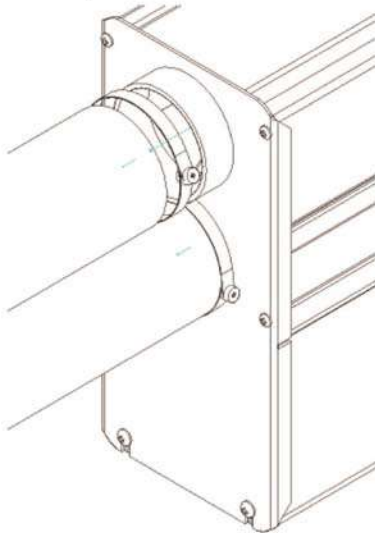


Figure 8: The pipes of both the blow and suction duct system are attached with hose clamps. The furnace extracts the air from the same end where the power cord and connectors for fuel and control panel are.

Figure 9: Connections of the fuel hose, power cord and control panel.



Plug in the Info Control Panel

Plug in the Basic Control Panel

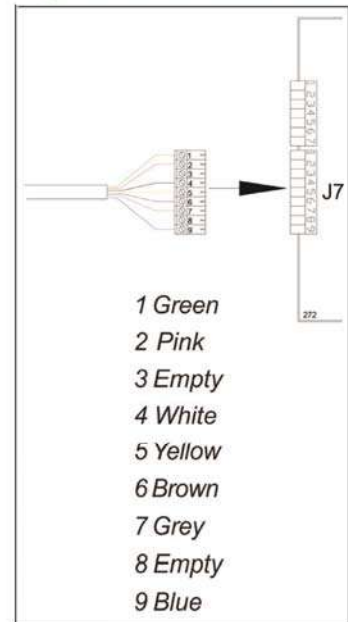
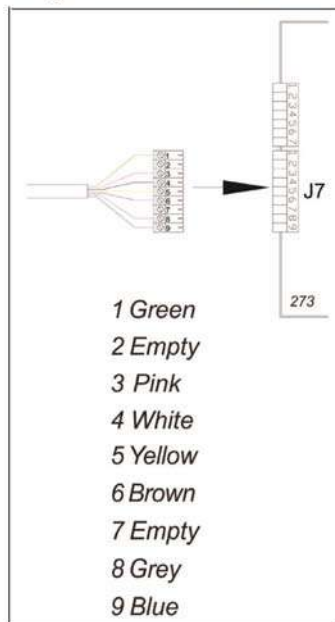
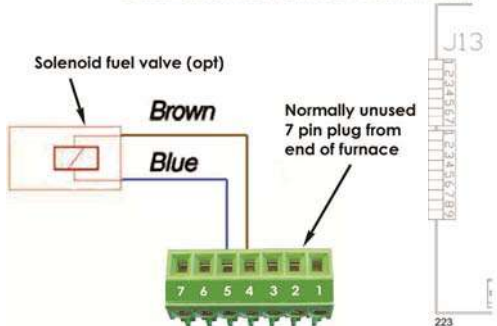


Figure 10: Wiring diagram of the solenoid valve or hourmeter.



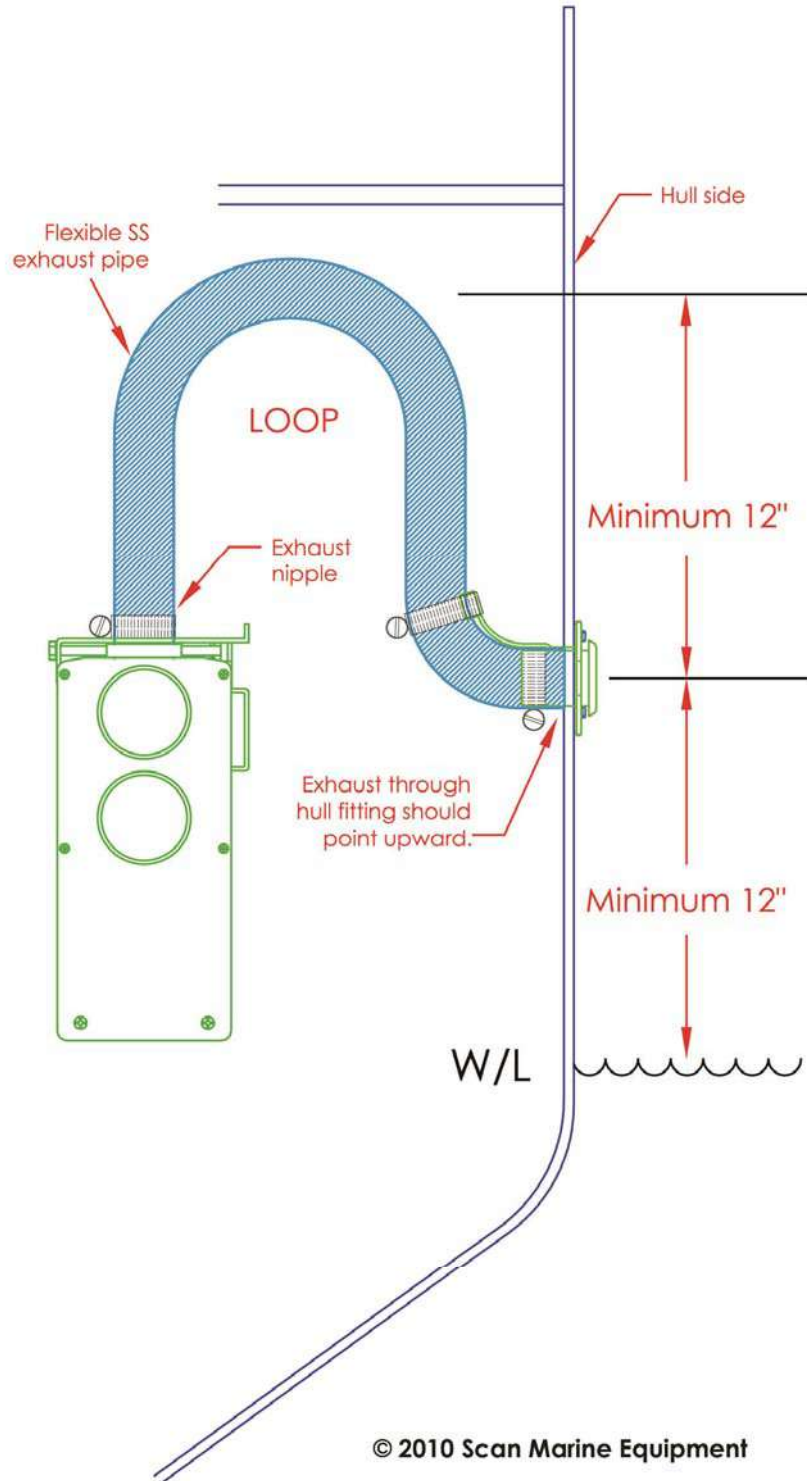
Wallas Furnace Exhaust Routing:

If your Wallas device is to be mounted in a location where the exhaust nipple is more than 12" above the through hull point, simply route the exhaust pipe from the stove to the through hull, without any low points or "bellies" in the run.

If your Wallas device is to be mounted in a location where the exhaust nipple is less than 12" above the through hull point, or you can't avoid having "bellies" in the run, use the installation method shown here. The loop shown prevents any water from entering the system.

Exhaust pipe should be covered with fiberglass insulating sock.

Configuration will be the same for either single or duplex exhaust systems.



Location in relation to the fuel tank.

The longest permissible fuel line is 26ft; the supplied length is 13ft. The fuel line must always contain a Wallas fuel filter.

We recommend that the furnace is placed 15 to 24 inches higher than the average level of fuel in the fuel tank. The fuel pump has been adjusted for this difference in height.

If the fuel level in the tank is more than 15 inches above or more than 60 inches below the furnace, the pump must be adjusted according to separate instructions available from your Wallas service center.

A solenoid valve must be installed into the fuel line near the fuel tank if the surface of the fuel is above the furnace. Contact Scan Marine with any questions you may have.

Warm-air ducting

The furnace is equipped with 2 x 3 inch (75mm) blower connections. In order to secure sufficient air flow, the heating air must be divided into at least three outlet vents.

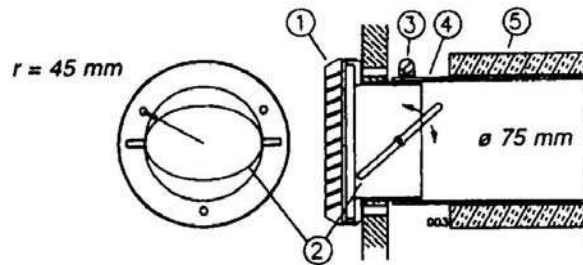
The ducting attaches to two 3 inch (75mm) outlet adaptors at the end of the furnace. The longest permissible length of one branch of the warm air duct is 26 ft.

The minimum diameter of the warm air ducts is 3" to prevent excessive back pressure, based on a minimum of three outlets.

The 3 inch outlet vents installed at the ends of the warm air ducts are equipped with an air valve to regulate the flow of warm air into the cabin. The air valve should be removed from the vent in the branch leading into the area needing the most heat. The flow of air to other areas may be controlled by adjusting the position of the appropriate valve. (See Figure 11)

Figure 11: Warm-air vent details

- 1. Vent grid,
- 2. Air Valve,
- 3. Clamp,
- 4. Air duct,
- 5. Insulation.



The use of a booster fan (P/N 3415) is recommended for ducts of excessive length. Information about the booster fan and its use can be obtained from your Wallas dealer.

All ducts over 3 ft. long, passing through unheated spaces should be insulated and all duct connections should be secured with hose clamps.

Inlet air ducting

Inlet air for the Nautic 40D furnace is taken through two 3 inch (75mm) air ducts. This allows the furnace to be installed in the engine compartment or other spaces where the air may be foul. One of the 2 x 3 inch (75mm) suction connections of the furnace is installed to extract fresh air from the outside, and the other to extract air from inside the boat. Protective grilles without throttle valves are attached to the ends of the suction pipes, and the opening for outdoor air also needs to be protected appropriately against the weather.

For safety reasons the furnace must not be installed in a place where gasoline fumes might be present.

The suction air is taken in via two branches of ducting. One inlet duct should take in some fresh air and the other inlet duct should take in return air from inside the boat. (See Figures 12, 14, 15)

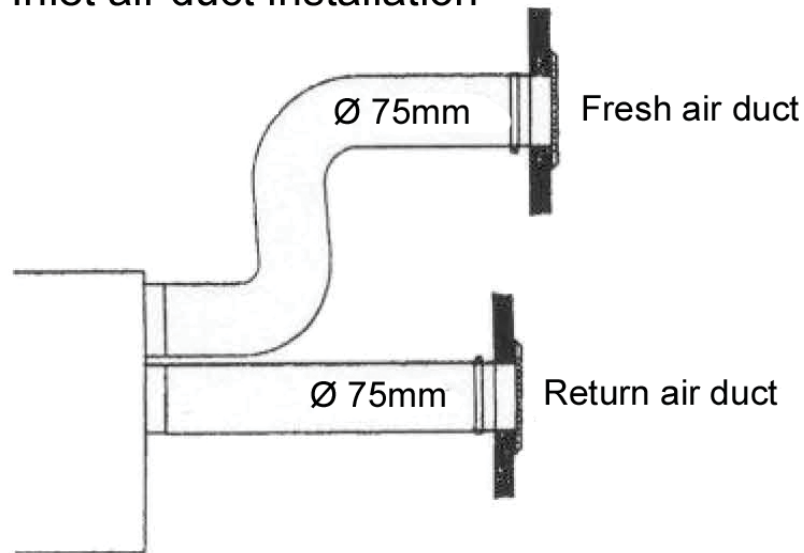
The longest permissible length of one branch of the suction air duct is 8 ft, based on a minimum diameter of the inlet air ducts being 3" to prevent excessive pressure drop.

Protective grilles should be connected to the ends of the inlet ducts. These grilles are available from Scan Marine.

Protect the opening of the fresh air inlet ducts with some form of weather/vermin shield. Protective shields for this purpose are available at most marine supply stores.

All inlet duct connections should be secured with hose clamps.

Figure 12: Inlet air duct installation



Operation Using Basic Control Panel

Heating

The furnace starts when the power switch is turned to the HEAT position. There is first a self testing phase during which the yellow and red lamps blink in turn. Then the yellow power indicator lamp will light up and the actual ignition process will begin. Ignition takes about 5 minutes during which the red heating lamp will light up. The heating lamp is lit when the combustion has stabilized in the burner.

After ignition the furnace can be adjusted with the control panel. The furnace will not necessarily start on the first try after installation, when the fuel hose is empty. Failure to start is indicated when the heating light starts to blink after the start-up. If this happens, move the power switch to the OFF position. The furnace cannot be restarted until the cooling fans have stopped and all indicator lamps have gone out. Once the indicator lamps have gone out, restart the furnace by switching it to the HEAT position.

Stopping

Turn the power switch to the OFF position to switch off the furnace. The cooling cycle of the furnace takes about 10 minutes after switch-off. During cooling

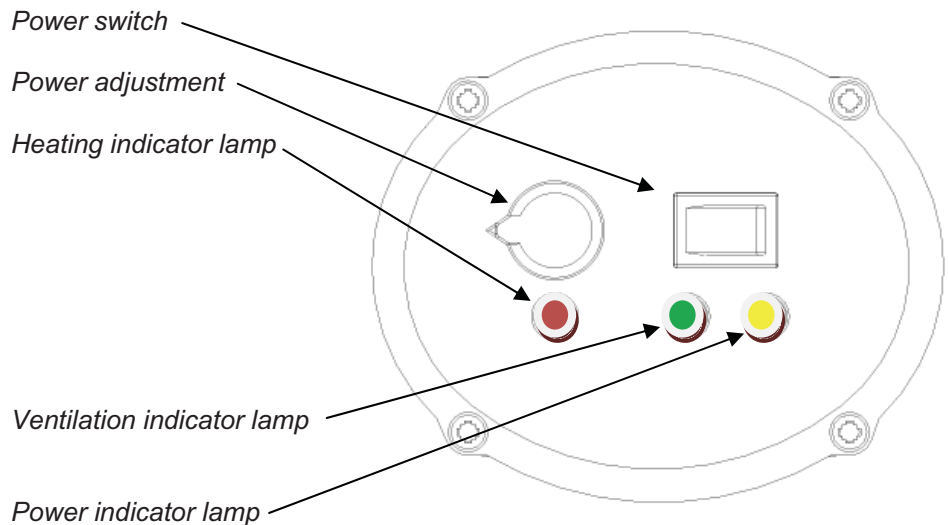
the power lamp is lit, and the red heating lamp blinks. After cooling all indicator lamps will go out.

Ventilation

Turn the power switch to VENT position to start ventilation. Both the yellow power indicator lamp and the green ventilation indicator lamp light up immediately. The efficiency of the ventilation air flow can be adjusted with the power adjustment knob. Turn the power switch to OFF position to stop ventilation.

BASIC CONTROL PANEL

Figure 16: Basic Control Panel 3004



Servicing

The technical parts of the furnace should be serviced according to general servicing recommendations of Wallas equipment. The safety functions in the furnace's electronics switch the furnace off in case of an error.

Fault Indication

When using a Basic Control Panel, the indicator lights show the cause of a system fault. Reset the fault by disconnecting the power from the furnace (i.e. unplug the power leads from the furnace). The cause of a fault must always be examined and repaired before the next start-up.

If necessary, contact Scan Marine Equipment for assistance.

System Fault Indications:

Table 1: Error state indicator lamps in the #3004 basic control panel.

Overheat	Red light blinks:	-- -- -- --
Flame out	Red light blinks:	-- -- -- --
Undervoltage (at ignition or after the flame is out)	Yellow light blinks.	-----
Glow plug, combustion blower or ventilation blower failure	Red light blinks:	-- -- -- --

If you purchase the #3005 Info Control Panel, please refer to the user manual for that device.

Using an external thermostat on Nautic 40D furnace with #3004 control panel

An external thermostat can be connected to the #3004 control panel cable as shown in Figure 13. (Connector pin 7 = grey wire). Because the current is small the wire thickness is not significant.

Any thermostat with closing contacts is suitable; the contacts should close when the thermostat asks for more heat. When installing, please note the thermostat manufacturer's instructions.

The thermostat will not switch the furnace on or off, but will adjust the furnace between minimum power and the user determined power setting (made with the power knob). See Figure 16.

The desired temperature is set on the thermostat, and the furnace power setting is set to the user's requirement (determined by environment / outside temperature). Turning the power knob to zero will defeat the thermostat function, higher power knob settings will make the thermostatic control more aggressive, lower settings more moderate.

Figure 13: Thermostat connections to 3004

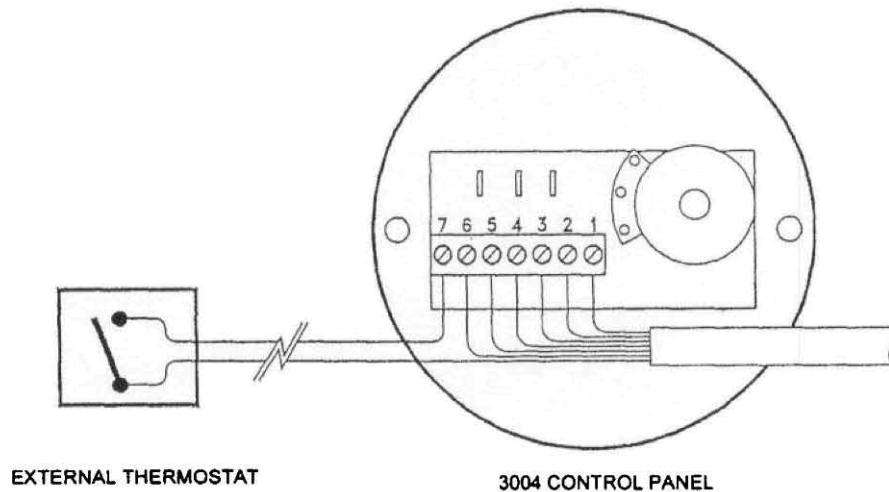


Figure 14

Example of typical Wallas Nautic 40D installation.

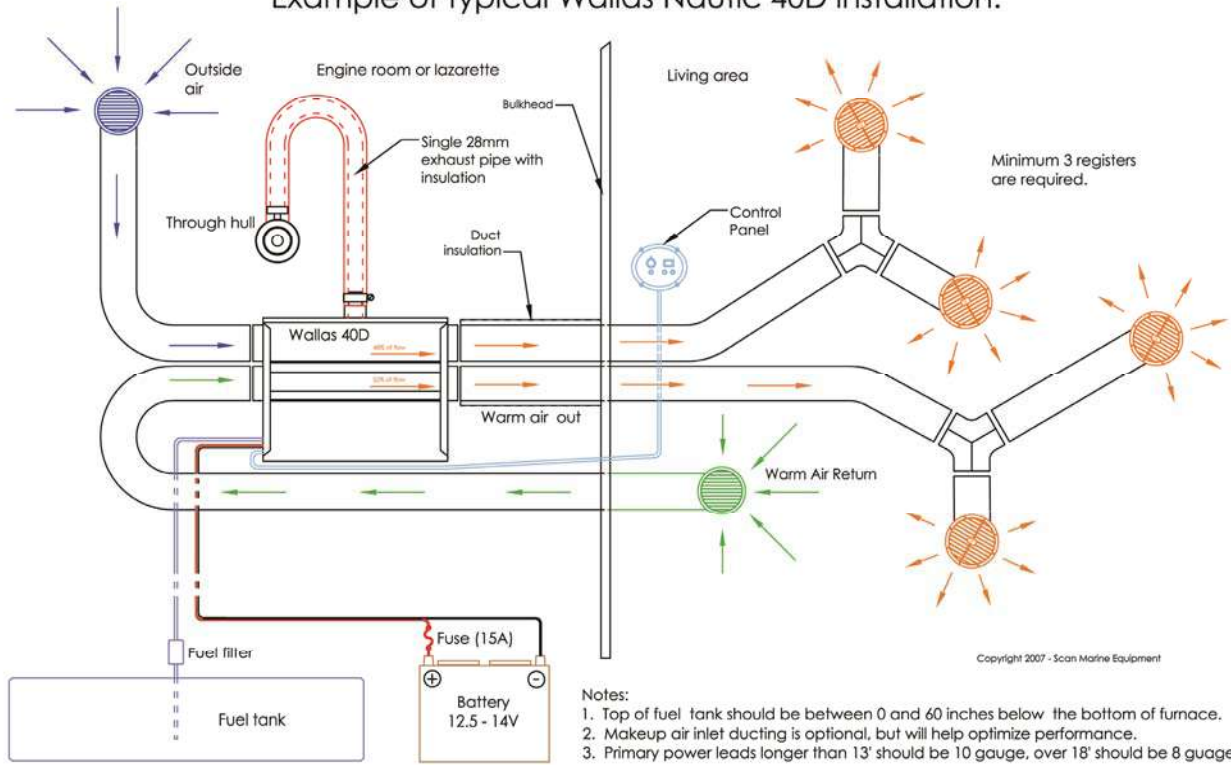
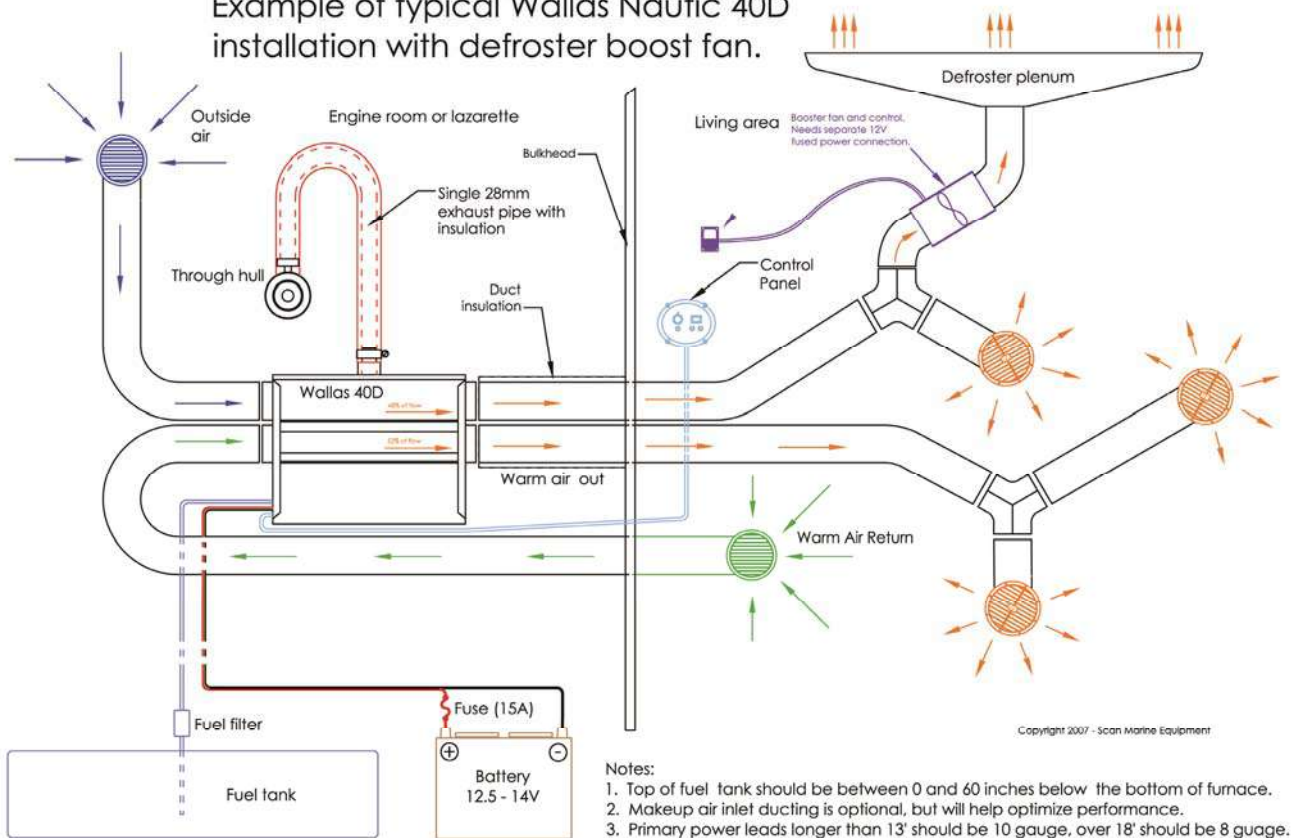


Figure 15

Example of typical Wallas Nautic 40D installation with defroster boost fan.



Fuel Lines & Filters

Wallas diesel products come with polyethylene fuel line kits shipped in the carton, which include a fuel filter & miscellaneous adapters.

If you purchase a Wallas day tank, these fuel line kits are not used, being replaced by a complete #367215 tank adapter kit. The #367215 kit has it's own tank end filter. Only one filter should be used.

The fuel lines are attached to the furnace using a three part compression fitting, shown in the images to the right. Correct first assembly of the fuel line fitting and mounting to the Wallas appliance is very important.

1. Make sure the fuel line end is cut cleanly and squarely.
2. Slide the nut on the fuel line, with the threads toward the line end.
3. Push the acorn over the end of the fuel line.
4. Slide the ferrule into the end of the fuel line until the flange sits snugly against the plastic tube.
5. Check the fuel fitting on the Wallas product and the acorn/ferrule end, making sure they are clean and free of debris.
6. Place the end of the acorn against the Wallas product's fuel fitting and slide the nut against the threads.
7. Spin the nut onto the threads and tighten very firmly. This process compresses the fitting.
8. Loosen the nut and re-tighten for a fully sealed fit.

Please note: ABYC and NMMA rules may require the use of fire rated fuel lines in new vessel applications. Please contact Scan Marine for these products and their correct application.

Figure 16

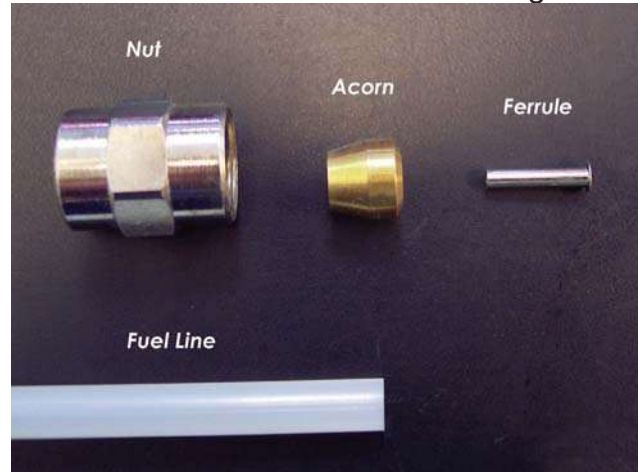
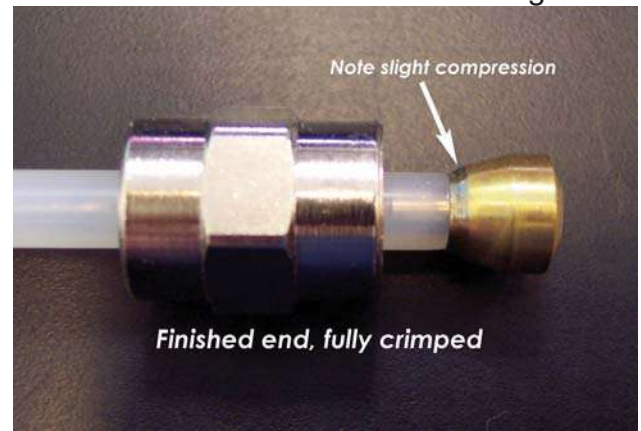


Figure 17



Figure 18



Installation checklist:

- When choosing the place for the device, remember the need to detach it for service.
- Ensure sufficient air supply for the device..
- Ensure sufficient circulation of air in the boat.
- Openings for incoming heating and ventilation air are placed at a minimum distance of 16" away from the fuel fill fitting and the tank breather fitting.
- The rated voltage of the device is 12 VDC, 12.6+ VDC required at unit prior to start.
- The current for the device is taken directly from the battery terminals or a battery buss using as short of cables as possible. See table 2.

Table 2

Cable Length in feet	Wire Size (AWG)
0-13	10
13- 20	8
Over 20	Contact Scan Marine

- An inline fuse is installed in the positive power cable near the battery.
- The fuel for the unit is from a separate tank pickup, not through the engine pickup.
- Install a filter in the fuel line. Note the need for replacing the filter periodically.
- Cut the fuel line to a suitable length during installation. Ensure that the fuel line joint surfaces are clean before assembling. Tighten the fuel line joints carefully and firmly, using two 12mm wrenches, one on the furnace fuel fitting and one on the fuel line compression nut. For initial installation, assemble & tighten fully, then loosen and re-tighten to assure an airtight seal.
- If the unit is situated lower than the fuel surface in the tank, install a solenoid valve in the fuel line close to the fuel tank.
- Note the temperature of the exhaust while choosing the place for installing the through hull.
- Any water entering the through hull is prevented from reaching the unit by using a gooseneck, a drain lock or a sealable exhaust fitting.
- Boats with a metal hull must isolate the unit and the through hull from the hull of the boat to prevent galvanic corrosion.
- Remember to read the instructions for installation, operation and service before installing the unit.

WALLAS 40D Operator's Manual and Installation Guide

WARRANTY:

Wallas Marin Oy (the manufacturer) shall be liable for eventual defects in the raw material or manufacture of the products and items sold by the importer for 12 months from the day of sale on the following conditions:

1. Measures to take in the event of a defect:

- a) Look on the check list on the website (www.wallas.com) to make sure the defect in question is not related to use, i.e. a simple problem not covered by the warranty.
- b) Notification of the defect must be given in writing immediately if possible and no later than two months after the appearance of the defect. After the warranty period ends, a referral back to a notification at the time of the warranty period is not valid unless the notification was made in writing. A valid receipt or another reliable official document of the time of purchase is required for the warranty.
- c) For repairs under warranty, the customer takes the product to the place of purchase (the seller is responsible for warranty issues) or to an authorized repair shop. Warranty service is not to take place outdoors or on a boat. The warranty does not cover costs for the removal and securing of the device or for damage caused by the incorrect packing of a device that has been sent for repair.
- d) The customer must provide the following information in writing for warranty service:
 - Description of the problem
 - A description of where and how the device was installed
 - Product type and serial number

2. The warranty is not valid in the following cases when:

- Components which are not approved by the manufacturer have been added to the device and/or if its structure has been modified without the consent of the manufacturer.
- The instructions for installation, operation or maintenance have not been followed.
- Storage or transport has been inappropriate.
- A problem has resulted from an accident or damage, which Wallas has had no control over (force majeure).
- Problems arise from normal wear and tear. The fan motors of the heaters (and ventilation hood assembly (85D+270) have a natural wear limit of 1500 hours. Exceeding this limit within the warranty period means the customer is no longer entitled to replace the motors under warranty.
- The product has suffered from improper handling, unsuitable fuel, low voltage, excess voltage, damage due to dirt or water.
- The device has been opened without the explicit permission of the importer
- Components other than Wallas' spare part components have been used in the repair of the device.

3. Repairs carried out during the warranty period do not renew or alter the original warranty period.

4. Indirect damages arising from a defective product are not covered by this warranty.

5. The warranty is only valid for boat products that have been installed in boats and for collage products that have been installed in cottages. The warranty does not cover installation in vehicles or other areas.

6. To enable us to offer a high standard of service, the seller must keep a buyer register to inform buyers, if necessary, of eventual matters concerning the warranty period or technical information, modifications or the updating of the device after the warranty period has expired.

7. This warranty does not limit rights written down in the consumer protection laws. When making a warranty claim, the customer must provide proof that the maintenance and safety Instructions have been thoroughly followed.

This warranty does not apply to defects which have arisen due to carelessness in following installation, operation and maintenance instructions.

40D

June 2, 2010



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