

Installation, Operation and Service Manual



INSTALLATIONS MUST MEET ALL LOCAL AND FEDERAL CODES THAT MAY DIFFER FROM THIS MANUAL

Please read the manual in its entirety before beginning installation. This manual must be kept with the oil-aerator for future reference. For maintenance or question, please refer to your installer – contractor directly.



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1. ABOUT THIS INSTRUCTION MANUAL

This instruction manual is part of the product.

Read this manual before using the product.

Keep this manual during the entire service life of the product and always have it readily available for reference.

Always hand this manual over to future owners or users of the product.

1.1 Structure of warning

WARNING TERM The type and source of danger is shown here.

- Precautions to take to avoid the danger are shown here.

Warning term	Meaning
DANGER	Imminent danger! Failure to observe the information will result in death or serious injuries.
WARNING	Possible imminent danger! Failure to observe the information may result in death or serious injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or serious injuries as well as damage to property.

2. SAFETY

2.1 Intended use

The Granby model E700 automatic fuel oil de-aerator may only be used in single-line systems with return pipe connection for continuous de-aeration of the following liquids in oil-fired systems:

- Not heavier than # 2 Home Heating Oil according to ASTM D396
- Biodiesel according to ASTM D6751
- Bio-fuel 0-20 % Biodiesel fuel oil blends according to ASTM D6751 and ASTM D396

Any use other than the use explicitly stated in this instruction manual is not permitted.



2.2 Predictable incorrect application

The automatic fuel oil de-aerator must never be used in the following:

• Use with undissolved additives, alcohols and acids

2.3 Safe handling

- This product represents state-of-the-art technology and is manufactured in accordance with the pertinent safety regulations. Each unit is subjected to a function and safety test prior to packaging.
- Operate the automatic fuel oil de-aerator only when it is in perfect condition. Always observe the instruction manual, all pertinent local and national directives and guidelines as well as health and safety regulations and directives regarding the prevention of accidents.

2.4 Qualification of personnel

The product may only be installed, commissioned, operated, maintained, shut down and disposed of by qualified, specially trained personnel.

Law or building codes may require an annual inspection by local or federal authorities.

2.5 Modifications to the product

Changes or modifications made to the product by unauthorised personnel may lead to malfunctions and are prohibited for safety reasons.

2.6 Use of spare parts and accessories

Use of unsuitable spare parts and accessories may cause damage to the product.

Use only the manufacturer's genuine spare parts and accessories.

2.7 Liability information

- The manufacturer shall not be liable for any direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations.
- The manufacturer and their representatives shall not be liable for costs or damages incurred by the user or by third parties in the use or application of this device, particularly in case of improper use of the device, misuse or malfunction of the connection, malfunction of the device or of connected devices. The manufacturer or their sales representatives shall not be liable for damages resulting from any use other than the use explicitly stated in this instruction manual.

The manufacturer shall not be liable for misprints.

3. PRODUCT DESCRIPTION



Fig. 1: Granby model E700 automatic oil de-aerator

Granby's model E700 automatic oil de-aerator consists of a die cast zinc housing with female G ¹/₄ threaded connections at the tank side (3/8" NPT once the TAS21 GRA1 fusible link valve has been installed) and ¹/₄" NPT connections for connections to the burner lines and features two separate float chambers. The lower float chamber contains the operating float; the upper float chamber contains the safety float. The upper float chamber keeps oil foam from escaping via the vent opening (e.g. during commissioning/filter exchange) and indicates malfunctions of the vent valve.

3.1 Function



- a Oil tank
- b Oil line to burner oil size inlet
- c Oil line from oil pump return outlet
- d Oil burner
- e Fusible link valve model TAS21 GRA1 by G.BEE GmbH (supplied)

Fig. 2: Granby Model E700 oil de-aerator with fusible link oil valve and oil filter (filter model used may vary)

The burner pump draws the fuel oil from the tank via the filter and the check valve installed in oil de-aerator and delivers it to the nozzle. The excess oil (i.e. the oil exceeding the nozzle capacity) is pumped into the float chamber via the return line into the float chamber. While the oil level gradually increases in the float chamber, the oil is de-aerated by the de-aeration valve. When the oil reaches a level of approx. 1-3/16" above the bottom, the floats begin to operate and actuate the bypass valve, thus delivering the de-aerated return oil to the suction pipe. This way, the system only draws the amount of oil from the tank via the filter which is needed for combustion. This considerably prolongs the filter service life.

The oil that now flows to the pump primarily consists of de-aerated fuel oil plus oil from the tank that still contains air.

3.2 Application examples



Fig. 3: Installation of Granby model 700 oil de-aerator above the tank level and suction pipe (with a steady gradient to the tank). Check valves must not be used anywhere on the oil line to the oil tank with Granby model E700 oil de-aerator installed foot valve must also be removed. All oil lines must be installed as per code requirements.



Fig. 4: Installation of Granby model E700 oil de-aerator below the tank level. It is recommended to install a diaphragm anti-siphon valve or an oil safety valve to prevent fuel oil from escaping in the case of a defective suction line with a higher oil level in the tank. In case of fire, the valve will prevent oil from running out and intensifying the fire. All oil lines must be installed as per code requirements.

4. SPECIFICATIONS

Table 1: Specifications

Parameter	Value
General specifications	
Dimensions: (W x H x D)	3.75" x 5.93" x 3.75"
Burner connection	1/4" NPT inner thread
Tank connection	G ¹ / ₄ female threads (3/8" NPT once fusible link valve is installed)
Nozzle capacity	Max. 26 gph
Return flow	Max. 37 gph
Oil flow	Max. 58 gph
Separation capacity air/gas	Over 4 quarts per hour
Mounting position	Float housing vertical to the top
Operating overpressure	Max. 5 psi (corresponds to static oil column of approx. 13.5 ft)
Suction vacuum	Max. 14.25" Hg
Test pressure	Max. 85 psi
Operating temperature	Max. 100 °F (38 °C)

4.1 Approvals, tests and conformities

Granby model E700 oil de-aerator is UL-tested to meet both Canada and USA requirements, file MH62597.

5. TRANSPORT AND STORAGE

CAUTION Damage to the product due to improper transport.

- Do not throw or drop the product

CAUTION Damage to the product due to improper storage.



- Protect the product from shock when storing it.
- Store the product in a clean and dry environment.

Do not operate products with visible damages.

6. INTALLATION AND COMMISSIONING

- The oil de-aerator must be installed in accordance with these instructions and in accordance with CAN/CSA-B139, Installation Code for Oil-Burning Equipment (Canada) or NFPA-31, Standard for the Installation of Oil-Burner Fuels and Other combustible Liquids (USA) and in compliance with any applicable local codes or regulations.
- The oil de-aerator shall be installed indoor.
- Mount the fusible link shut off valve model TAS21 GRA1 to the female G ¹/₄ threads of the housing. Install the copper gasket (supplied) between the fusible link shut off valve and the de-aerator housing.
- Mount the oil line from oil tank to the 3/8" NPT threads of fusible link shut off valve. The oil line must be sized in accordance with the burner installation instructions. Use a non-hardening thread sealing compound on the threads.



- Mount the burner supply and return oil lines to the female ¹/₄" NPT threads of the housing. Use a non-hardening thread sealing compound on the threads.
- Install the oil-de-aerator between the burner and the manual shut-off valve, close to the oil burner.
- Never use the oil de-aerator in ambient temperatures greater than 100 °F. Do not mount the product near uninsulated burners, over burner opening flaps or next to chimney flues.
- Mount the oil de-aerator securely to side wall of the boiler or furnace with the float chamber vertically, pointing to the top. Use the enclosed sheet metal self tapping screws and refer to section 6.1 for distance between the screws.
- Remove all check valves between oil de-aerator and tank.
- Use oil lines as per local codes for connection to the oil pump.
- Ensure that the pump is set for two-pipe operation when mounting the product. Bypass plug must be installed in return oil outlet in the pump.
- Install an oil filter in the supply line upstream of the oil de-aerator.
- Never install a shut-off value or other device, which can impede flow in the lines between the oil de-aerator and the oil pump.
- All pipework must be tested during installation.
- Never use an oil de-aerator with pump pressure (booster pump) between tank and oil deaerator.
- Test the completed installation for correct function and fire security before starting.

CAUTION Damage to the pump or oil de-aerator due to incorrect connection of supply and return connections.



• Do not confuse the supply and return connections (not even during commissioning for a short period of time)

6.1 Mounting flange dimensions (Inch left and metric right)

6.2 Pressure test

When subjecting the suction pipe to a pressure test, the pressure connection must not be made at the oil de-aerator unit since the non-return valve integrated in the device does not allow the pressure to be applied to the suction pipe. Therefore, the device is not to be included in the pressure test.

6.3 Parallel connection

Two oil-de-aerators can be connected in parallel if:

- The air extraction rate exceeds the limits specified in Table 1;
- The oil flow rates are in excess of the limits specified in Table 1.



Fig. 5: Parallel operation of two oil de-aerator units



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- a Return oil line from burner pump
- b Supply oil line to burner pump
- c Oil line from tank
- d Fusible link valve model TAS21 GRA1 by G.BEE GmbH (supplied)
- e Oil filter (use approved model only)

6.4 Connecting the vent hose

а

b

To prevent odours from the separated air (e.g. if the unit is installed in living quarters), a vent hose can be connected to the oil de-aerator hood.



Vent hose Hose connection with O ring

Fig. 6: Model E700 oil de-aerator



- 1. Remove the cover using a screwdriver. Mount the enclosed hose connection.
- 2. Push the vent hose onto the hose connection.

7. OPERATION

7.1 Oil foam

Oil foam may build up if the amount of air sucked into the de-aerator exceeds the separating capacity of the product (1 gph).

Possible reasons:

- Leak in the suction line
- · Fitting connections at the suction side not tight
- Vacuum pressure in oil tank line rating exceeds oil de-aerator capacity

7.20il level in the float housing

The oil level depends on the operating conditions of the facility and amounts to approx. 0.8" - 2" in suction mode.

If the oil level is higher, the float housing may be fully filled with oil if the suction line is tight. This is caused by the absorption of the air through the fuel oil. Over time, this results in a reduction of the air cushion.

When the operating conditions change (e.g. decreasing oil level in the tank), the air cushion is formed again in the float housing.

7.3 Pressure mode

Since in pressure mode with an oil pump there is no gas formation caused by suction, it is not meaningful to use an oil vent in this mode.

8. TROUBLESHOOTING

Table 3: Troubleshooting

Problem	Possible reason	Remedy
Oil foam: The amount of air	Leak in the suction	Check the suction pipe for
sucked into the de- aerator	pipe.	leaks.
exceeds the separating	Initial commissioning	Use a suction pump for the
capacity of the de- vice (1.05	(without separate	commissioning.
gph).	suction pump).	
	Suction pipe	The oil line must be sized in
Note: In single-pipe mode, only	dimensions too great.	accordance with the burner
the amount consumed by the		installation instructions.
burner is transported through		
the suction pipe.		
The de-aerators is fully filled	Pressure in the feed	Install an oil safety valve on
with oil	line (tank higher than	the feed line from the tank.
	burner). This won't	The oil level will resume its
	affect the function of the	normal level in the oil de-
	pump.	aerator.



9. DECOMMISSIONING, DISPOSAL

1. Dismount oil de-aerator.

2. To protect the environment, this product must not be disposed of together with the normal household waste. Dispose of the product according to according to local directives and guide-lines.

This product consists of materials that can be reused by recycling firms.

10. WARRANTY

The Granby model E700 oil de-aerator is warrantied against manufacturing defects for a period of 12 months from date of purchase. This warranty applies to all countries in which this product is sold by the manufacturer or its authorised representatives.

The Series E700 is factory tested and sealed. Tampering will void Warranty.

11. COPYRIGHT

The manufacturer holds the copyright to this manual. This manual may only be reprinted, translated, copied in part or in whole with the prior written consent of the manufacturer.

We reserve the right to modify any specifications or alter any illustrations in this manual without prior notice.

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