

# Operating Instructions

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## GF 900 Gas Filling Station (with pressure display)

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# 1. Introduction

The GF900 gas filling station is an assembly comprising a rotary pump, valves, gas connections and gas pressure display. The GF900 is a supporting unit for the nF900 nanosecond flashlamp and is designed for purging and re-filling purposes of the operating gas.

The pump is a single stage, direct drive, sliding vane, oil sealed pump. The pump comes either for 230V ac / 50Hz or for 115V ac, 50/60 Hz.

## Warning

Never operate the pump at other mains voltages and frequencies as specified. Other voltages and frequencies will cause malfunctioning of the pump

## Warning

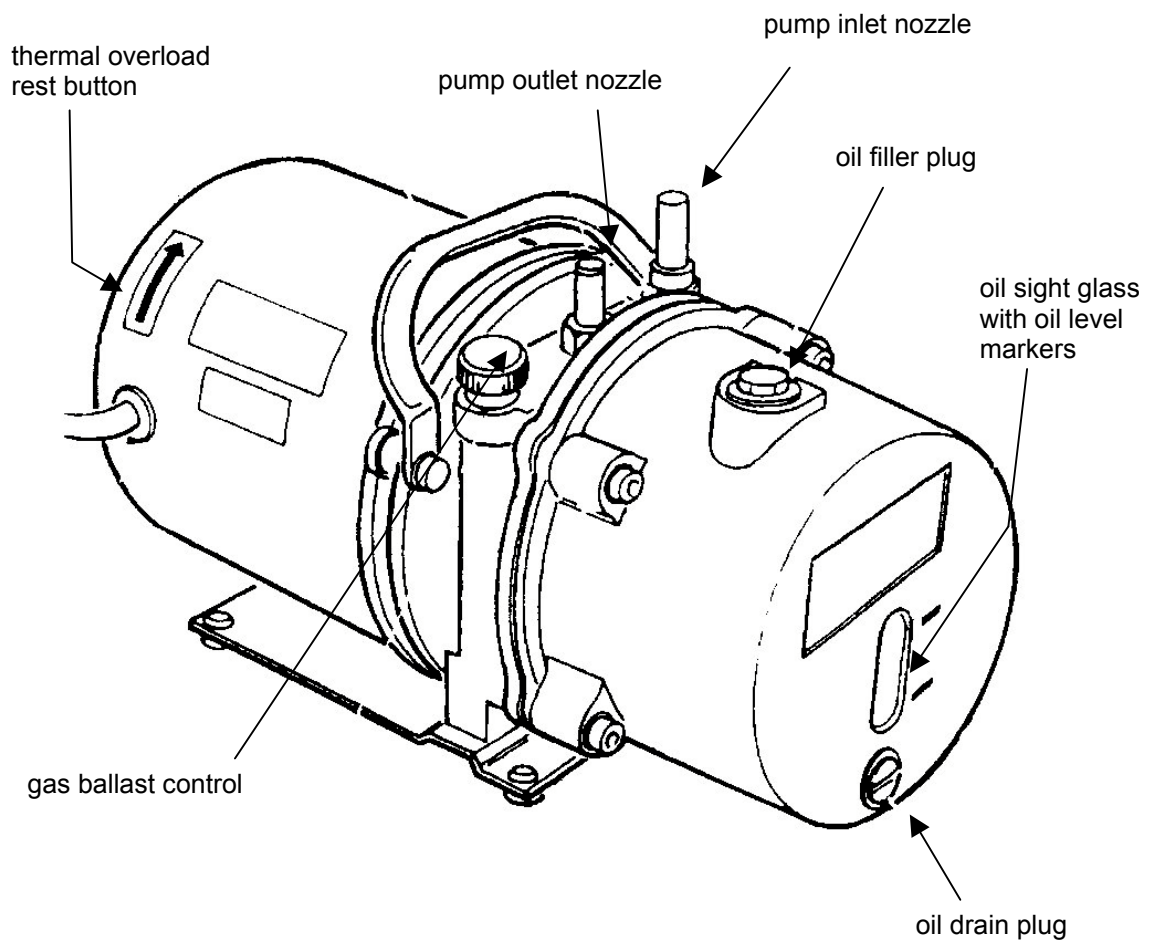
Never operate the pump without vacuum oil. Ensure that the pump has been filled up with oil before use. The oil level must be within the limits given by the oil sight glass on the back of the pump unit.

The GF900 is fitted with two isolation valves, one to separate the gas inlet from the outlet and one to separate the pump from the outlet. The valves contain flexible elastomer diaphragms, sealing against a polished alloy seat. The valves are very robust and made for long life.

The gas inlet and the gas outlet are fitted with a 1/4" (6.7mm) swage lock connectors. Nylon gas tubing of 1/4" (6.7mm) outer diameter is supplied with the gas filling station to install the connections to the gas cylinder (gas inlet) and the nanosecond flashlamp head (gas outlet).

The housing on top of the gas filling station contains the pressure display. Gas pressure is displayed in bars. The maximum gas pressure should not exceed 2 bars, the minimum is given by the number of digits on the gas meter (minimum <0.01 bar).

In routine nF900 re-filling procedures the GF900 is only operating for a short period (approx. 5min), so that the exhaust gas can be released into the room. If the pump is to operate over longer periods pump outlet should be connected to a proper gas vent system to avoid air pollution.



rear view of the GF900 pump

## 2. Transit and Packing

The GF900 gas filling station comes fully assembled with in- and outlet-valves closed and oil drained.

The assembly is separately packed and should be shipped upright to avoid spillage of oil residuals.

One litre pump oil is supplied with the GF900.

230V pumps have a UK mains plug fitted to the mains cable. 115V pumps come with a US mains plug.

A separate cable is supplied for the pressure monitor, to be fitted between pressure monitor of the GF900 and the pressure sensor at the nf900 lamp head.





## **3. Installation**

### **3.1. Oil**

Fill vacuum pump oil into the pump. Access is given after removal of the oil filler plug (see picture in paragraph 1). Only high quality mechanical vacuum pump oil should be used.

The oil level can be observed at the oil sight window. Do not exceed the allowed maximum level.

### **3.2. Electrical Connections**

Use the interface cable delivered with the GF900 to connect the pressure meter (connector at the rear side of the GF900) to the pressure sensor of the nanosecond flashlamp head.

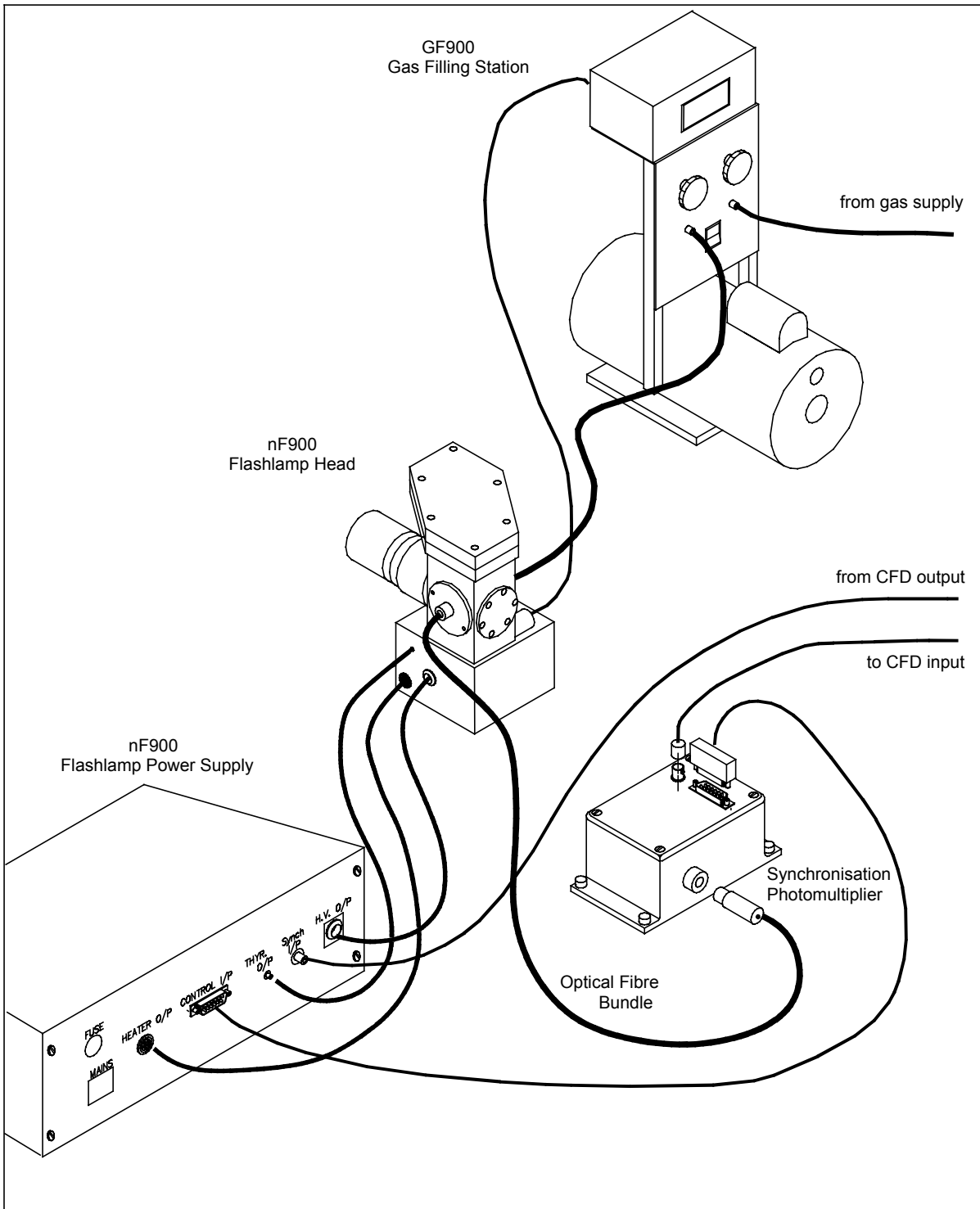
Plug the mains cable into the mains supply. Ensure that the voltage and frequency ratings of the supply satisfy the requirements given on the pump.

The pressure meter will be active as soon as the gas filling station is connected to the mains supply.

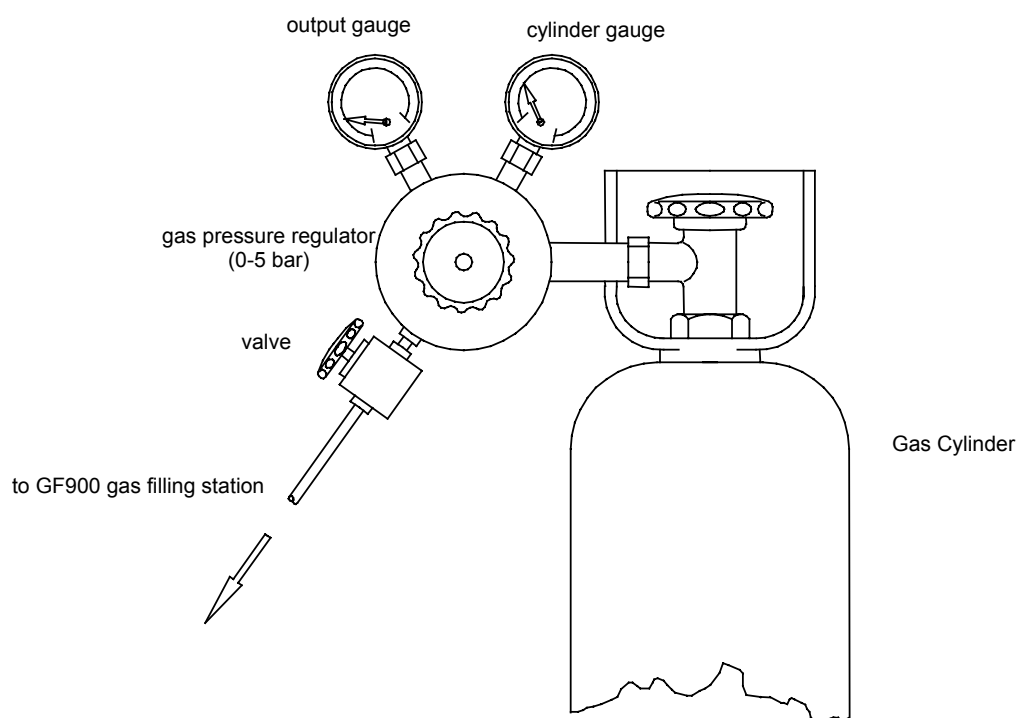
### **3.3. Gas Connections**

Use the ¼" (6.4mm OD) tubing supplied to connect the gas cylinder valve to the gas inlet of the GF900, and the outlet of the GF900 to the flashlamp head.

For additional connections of the GF900 gas filling station within the nanosecond flashlamp assembly see the figure on the next page.



The gas filling station receives the filler gas from a gas reservoir, usually a gas cylinder. The output of the gas cylinder should have a pressure regulator and an additional cut-off valve with  $\frac{1}{4}$ " fittings. The user is responsible for supplying the gas cylinder and the pressure regulator / valve. All gas connections should be made very carefully to ensure vacuum integrity.



recommended gas supply set-up



## 4. Operation

The GF900 is used for purging (cleaning) the flashlamp gas chamber and for adjusting the correct operating gas pressure.

Before starting the pump process ensure that the valves on the gas supply cylinder are still closed. Then open the insulating valves and carefully open the needle valve of the pressure regulator assembly fixed to the top of the supply cylinder to adjust the gas pressure, while at the same time observing the gas pressure on the GF900 display. The needle valve is correctly adjusted when the reading displays a value between 1.5 bars and 1.8 bars.

Purging the lamp gas chamber is performed as follows.

1. Switch the pump on.
2. Open the valve marked "PUMP". An acoustical noise will indicate the pump process. At the same time the gas pressure monitor should show a decrease of the gas pressure, down to 0.00 (less than 0.01 bar).
3. Close the "PUMP" valve.
4. Open the valve marked "GAS". At this time the gas pressure displayed on the GF900 pressure meter should read about 1.5 bars to 1.8 bars.
5. Close the "GAS" valve.
6. Repeat now steps 2. – 5. About 5 to 10 times. The number of repetitions depends on the length of the tubes between gas cylinder and GF900 and between GF900 and nanosecond flashlamp head. Longer gas tubes require more "pump-fill" repetitions than shorter gas tubes to ensure high purity of the gas within the lamp chamber.

The final gas pressure will be adjusted as follows:

After the lamp has been filled with gas and the gas supply has been isolated (step 5 of the lamp purging instructions above) slowly open the "PUMP" valve. Close the pump valve when the final gas pressure has been reached.

Note:

During the warm-up period of the nanosecond flashlamp and during the first 20 – 30 min of operation a slight increase of the gas pressure may be observed (about 0.2 bar). This is due to the expansion of the gas and is no reason for concern. It is, however, important not to tolerate gas leaks. Gas contamination will inevitably result in reduced flashlamp performance.

### **Warning**

Follow the safety rules for operating the gas. Hydrogen in particular can cause explosions !



## 5. Technical Specification

Supply:	230 V ac @ 50 Hz 115 V ac @ 50 / 60 Hz see specification on the pump
Power:	400 W
Fuse Rating:	5A (anti surge) (230V ac) 10A (anti surge) (115V ac)
Size	480mm (H) x 160mm (W) x 380mm (D)
Weight:	17.5 kg
Pump type:	single stage, direct drive, sliding vane, oil sealed pump
Pump Oil:	: High quality mechanical vacuum pump oil
Pressure Display:	3 digit LED
Pressure Range:	< 0.01 bar .... 2 bar





## 6. Warranty

- 1 a) The Company guarantees the equipment forming the subject of the contract/quotation against defective materials and workmanship for a period of one year from the date of delivery to the Purchaser.
  - b) In the case of sub-assemblies of equipment not manufactured by the Company, but incorporated in the equipment ordered, the Purchaser will be entitled only to the benefit and/or limitations of any guarantee given by the makers of such assemblies.
  - c) In no event shall the Company be liable for any consequential loss or damage arising from failure of the equipment under warranty.
  - d) At the end of the one year period referred to herein, all claims upon all liability of the Company shall be absolutely at an end.
- 2 a) The Company also warrants that the equipment conforms to specifications contained in current brochures or to extra specifications confirmed in writing at the time of order acknowledgement.
  - b) No warranty is made or implied as to the suitability of any equipment for the Purchaser's intended use beyond such performance specifications as form part of the contract.
3. The purchaser warrants:
  - a) That he will carefully examine and list all parts of the equipment supplied by the Company and notify the Company in writing of any shortage, defect or failure to comply with the contract, which is or ought to be apparent upon such examination and test, within 48 hours of the equipment being delivered to or collected by the Purchaser.
  - b) The equipment will be operated in accordance with the instructions and advice detailed in the appropriate operating instructions manual, or any other instructions which may be provided by the Company. The Company shall not be held responsible for any defect arising from the Purchaser's failure to comply with these recommendations and instructions or from damage arising from negligence or exposure to adverse environmental conditions.
4. The warranty is effective when:
  - a) Any defects in the equipment supplied are notified immediately by the Purchaser to the Company.
  - b) The equipment is returned to the Company at its Edinburgh premises, transportation and insurance prepaid, and undamaged by the failure to provide sufficient packaging.
  - c) The Purchaser has made payment in full for the contract in accordance with the Company's normal trading terms, i.e. 30 days from date of invoice.
5. The warranty covers:
  - a) Engineer's time costs during inspection and repair.
  - b) Any materials or components, which require to be replaced.
  - c) Return carriage costs to the Purchaser
6. However, if the Purchaser requests a service engineer to carry out the necessary inspection and repair of the equipment covered by the warranty on site, the Purchaser will be liable, at the Company's discretion, for:
  - a) Engineer's travelling time costs.
  - b) Engineer's travelling and accommodation expenses.

The timing of the inspection and repair of the equipment will be determined entirely at the discretion of the Company.



## 7. CE Declaration of Conformity



Manufactured by:                   Edinburgh Instruments Ltd.  
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Applicable Standards:           Generic Immunity                   EN 50082-1 : 1992  
  Generic Emission                 EN 50081-1 : 1992  
  Electrical Safety Standards    EN 61010-1 : 1993

**Edinburgh Instruments Ltd. certify that this equipment conforms with the protection requirements of the above Directives.**