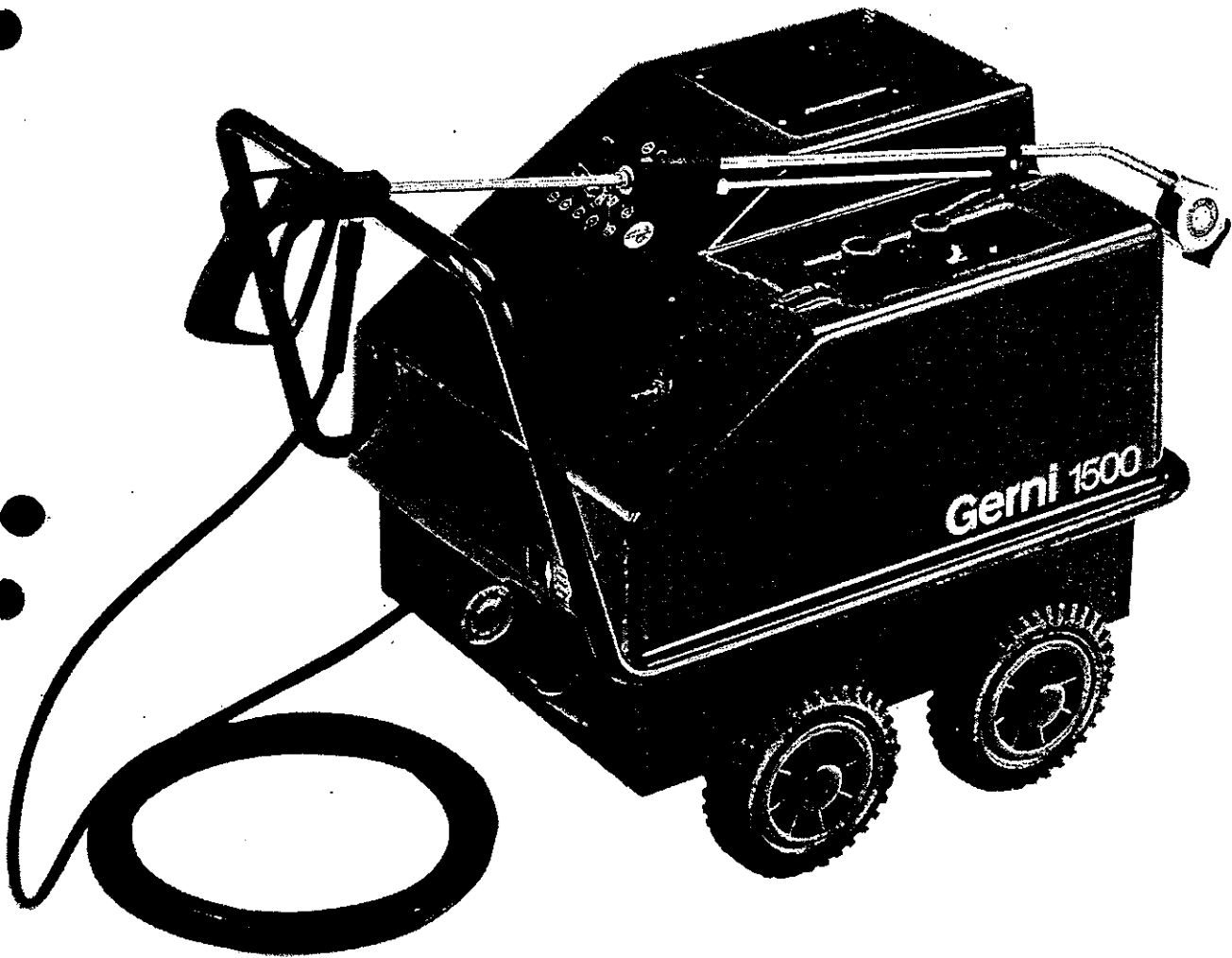


# Gerni

NILFISK-GERNI A/S. MYNTEVEJ 2. DK-8900 RANDERØS. DENMARK. TEL. 86 42 84 33. TELEX 65 123 DK. TELEFAX 86 43 14 81



**G-1500**

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# ENGLISH

## INTRODUCTION

Allow us to congratulate you on the purchase of your new Gerni high pressure cleaner. We are confident that your new high pressure cleaner will fully come up to your expectations of a machine produced by one of Europe's foremost manufacturers.

Nilfisk-Gerni A/S cover all industries with a complete range of cold and hot water cleaners and supply a wide range of accessories.

To ensure that you derive the full benefit from your Gerni equipment, please study the following manual.

The manual should be considered as part of your high pressure cleaner and should always be within reach of the operator. The manual provides a brief account of the construction and operation of your Gerni equipment.

All Gerni high pressure cleaners are constructed for simple and quick operation. Nevertheless, if problems occur which you cannot solve yourself with the aid of this manual, please

contact our service department whose experience and expertise will be at your disposal.

Following the instructions in this manual will ensure economical and reliable operation of your Gerni high pressure cleaner.

In the manual references to pictures will be indicated as, for example, (2.28) which means that reference is given to picture No. 2 and item No. 28 (in this instance, the high pressure hose).

Type: .....

No: .....

Date of purchase: .....

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# SAFETY

When using your new high pressure cleaner, the following safety precautions should be observed:

1. The machine must be earthed according to regulations.
2. Never exceed the maximum pressures and temperatures indicated on the machine plate.
3. In case of operational difficulties and repair, switch off the high pressure cleaner at the mains and turn off the water supply.
4. After operation, switch off the high pressure cleaner at the mains and turn off the water supply. Always lock the pistol with the safety device on the trigger when you leave the machine.
5. For reasons of safety and health, the operation of oil heated high pressure cleaners is permitted only where certain regulations governing, for example, air intakes and flues are observed.  
Local regulations governing the operation of oil-heated hot water cleaners must be observed.
6. Use only original Gerni high pressure hoses. Do not use non-Gerni high pressure hoses as they do not comply with the safety standards required by Nilfisk-Gerni A/S. Never attempt to repair defective high pressure hoses yourself.
7. The water jet is delivered from the Turbo nozzle at high speed, therefore, never aim the jet at people, animals, electrical installations or any electric cables/conductors.
8. Water jets in connection with leaks may be dangerous, they should, therefore, always be avoided.
9. It is recommended that protective clothing be worn.
10. The lance and pistol should always be held in both hands.
11. Never attempt to exchange the pistol or disconnect the hoses before the high pressure cleaner is switched off and the pressure relieved.
12. Where a larger working radius than the standard radius of the high pressure cleaner is required, the high pressure hose should be extended - not the electric cable.
13. Place the high pressure cleaner as far away from the cleaning area as possible.
14. Never allow children or unauthorised personnel to operate the high pressure cleaner.
15. Only detergents specially made for high pressure cleaners should be used.

## DESCRIPTION OF THE HIGH PRESSURE CLEANER

Your new Gerni high pressure cleaner is constructed as shown in the function diagram and photograph Nos. 2-3. The machine consists of a low pressure side and a high pressure side with a built-in boiler system and high pressure pump. From the water inlet (3.3), water is passed through the float valve (2.10) into the pre heater (2.6) and down into the water box (2.7). At maximum water level the float valve shuts off the water supply. From the water box, water is sucked up into the three cylinder pump (2.14) driven by the electric motor (2.13). Here the water is pressurised and pumped through the pressure valves, out into the high pressure side through the flow switch (2.15) and into the coil (2.16) where during hot water operation it is heated to the required temperature. The operating temperature is set and adjusted on the thermostat (2.24). The water is pumped through the outlet to the high pressure hose (2.18) the pistol (2.19), the lances (2.21) and out through the Turbo Laser nozzle (2.22).

The pressure of your high pressure cleaner can be adjusted on the pressure regulation handle (2.20) and can be read on the pressure gauge (2.25). Releasing the pistol grip stops the water flow.

The by-pass valve, which also functions as a safety valve, comes into operation if the pressure exceeds the operating pressure of the high pressure cleaner by more than 10%. In addition to the safety valve, the machine is fitted with a flow switch (2.15) that registers water flow and gives protection against overheating in the case of water supply failure. The switch cuts off the oil burner via the solenoid valve. Thermal cutouts in the pump motor stator windings protect the electric motor against overload. The oil pump (2.4) driven by electric motor (2.3) sucks fuel from the fuel tank (2.1).

The high pressure cleaner can operate with either cold or hot water. With hot-water operation, the water is pre-heated on the low pressure side in the preheater (2.6), while on the high

pressure side it is heated to operating temperature in the boiler coil (2.16).

Your new high pressure cleaner incorporates an automatic chemical injector.

- |      |                                    |
|------|------------------------------------|
| 2.1  | Fuel tank                          |
| 2.2  | Fuel filter                        |
| 2.3  | Electric motor for burner unit     |
| 2.4  | Fuel pump                          |
| 2.5  | Oil burner                         |
| 2.6  | Pre-heater                         |
| 2.7  | Water box                          |
| 2.8  | Float                              |
| 2.10 | Float valve                        |
| 2.11 | External chemical container        |
| 2.12 | Chemical connection                |
| 2.13 | Electric motor, high pressure pump |
| 2.14 | High pressure pump                 |
| 2.15 | Flow switch                        |
| 2.16 | Boiler coil                        |
| 2.17 | Thermostat sensor                  |
| 2.18 | High-pressure hose                 |
| 2.19 | Pistol                             |
| 2.20 | Pressure regulation handle         |
| 2.21 | Lances                             |
| 2.22 | Turbo Laser                        |
| 2.23 | Start/stop knob                    |
| 2.24 | Operating thermostat               |
| 2.25 | Pressure gauge                     |
| 2.26 | Fuel filler                        |
| 2.27 | Dipstick                           |
| 2.28 | Oil sightglass                     |
| 2.29 | Oil sponge                         |
| 3.1  | Pressure outlet                    |
| 3.2  | Drain-off, boiler shell            |
| 3.3  | Water inlet/water filter           |

# OPERATING AND STARTING GUIDE

## Start

1. Check the pump oil level (with pump at standstill only). The oil must be at the "MAX" mark on the dipstick (2.27). If necessary, add oil, "SAE 10W/40" in the sight glass. The water supply hose must be flushed through before connecting the high pressure cleaner. The hose should be min. 3/4". Note that the minimum water inlet pressure must be 1 bar/14 psi and maximum 10 bar/145 psi. The machine must not be allowed to idle for more than 15 minutes.

2. Connect the electric cable. Remember that the machine must be earthed. Note the rated voltage and amperage:

1 x 220 - 240 V 50 Hz 10.5 A

3. Fill the fuel tank (2.1) with clean diesel oil. There must always be fuel in the fuel tank to lubricate the oil pump (2.4).

4. Fit the lance, with high pressure hose, on the pressure outlet. Turn the start/stop knob (2.23) to pos. "1". The machine should start. The high pressure cleaner is now ready for use. Open the pressure regulation handle and activate the pistol (2.19).

5. With the Turbo Laser Lance, it is possible to increase or reduce the pressure via the pressure regulation handle (2.20). Change over from cold to hot water - all temperature changeovers - must be performed in the following sequence:

- a. Turn the start/stop knob (2.23) from pos. "1" to pos. "burner" (the pistol must be closed).
- b. Set the operating thermostat (2.24) at the required temperature.

## Stop

To stop the cleaner, turn the start/stop knob (2.23) to pos. "0". The pistol must always be locked with the safety device during pauses and when work is finished. When work is finished, the machine electrical and water supply should be shut off so that the cleaner cannot be used by unauthorised persons.

## High pressure hose

Your new high pressure cleaner is equipped with a heavy high pressure hose. Do not attempt to pull the hose when moving the high pressure cleaner as this might damage the hose. Do not run over the high pressure hose. The warranty does not cover broken hoses or hoses that have been run over.

## Turbo Laser Lance

The high pressure cleaner is also equipped with a Turbo Laser Lance which significantly increases cleaning efficiency (see technical data). With the Turbo Laser Lance, the pressure and chemical supply can be regulated via the pressure regulation handle (2.20).

**Note! When using the Turbo Laser Lance, the temperature must not exceed 90°C/194°F.**

## Water failure protection

The high pressure cleaner is protected against overheating from water supply failure. In the event of water supply failure, the flow switch (2.15) cuts out the solenoid valve and thereby cuts off fuel supply to the oil burner.

## Operating thermostat

The hot water temperature is adjustable from 45 - 90°C/113 - 194°F on the operating thermostat (2.24).

## Application of detergents

The high pressure cleaner incorporates an automatic chemical injector. Place the chemical hose with filter in the chemical container. Open the pressure regulation handle (2.20) completely and allow the high pressure cleaner to automatically suck the chemical until you close the pressure regulation handle again. After using chemicals, the chemical hose and ball check valve should be flushed through with clean water because residue can deposit in the ball check valve which will prevent the valve from sealing.

# MAINTENANCE

## Oil level

The oil level should be checked every day. The oil should be at the "MAX" mark on the dipstick (2.27). Read off the oil level during standstill. Take out the dipstick and re-fill if necessary, with "SAE 10W/40" in the oil sight glass. Any condensate will be collected in the oil sponge (2.29) located under the pump. Rinse out the sponge if necessary.

## Oil change

The pump oil should be changed after max. 100 working hours (to remove condensed water), and at least once a year. The amount and type of oil is 0.17 litres of "SAE 10W/40".

## Water filter

Clean the water filter (3.3) regularly. Disconnect the supply hose and water filter to clean.

## Fine sand filter

If you use water from a well containing particles of sand, we recommend the fitting of a fine sand filter. The filter insert, can be replaced when necessary. If this filter is not fitted, there is the risk of particles of sand being deposited in the by-pass valve. This may result in damage both to the by-pass valve and to the pump. Such damage is not covered by the warranty.

## Turbo Laser

Clean the filter in the Turbo Laser lance regularly. The filter is fitted on the inlet connection at the regulation handle and prevents small particles of chalk and sand reaching the Turbo Laser head causing wear, leakage and, in the worst case, operational malfunction. It can be necessary to change the filter. If so, insert a screwdriver or similar tool through the filter and draw it out. The new filter must be fitted with an O-ring and pressed down into

the Turbo Laser lance connection. Note that the filter must be located so that its largest surface is towards the Turbo Laser head.

When inspecting or replacing parts in the Turbo Laser, spray metal parts with "WD 40", "Pronto Universal", "Servisol", "Caramba" or a corresponding product able to:

- a. counteract moisture
- b. protect against corrosion
- c. lubricate and clean

We also recommend the above treatment when the high-pressure cleaner is not to be used for longer periods. If the Turbo Laser runs too slowly, or the oscillating function ceases, see "Fault finding".

### De-scaling

The removal of lime scale is necessary every 6 months (depending on the hardness of the water) and when pressure is increased over 5 bar/72 psi or more.

1. Disconnect the water supply hose (3.3).
2. Remove the body (remember to reconnect the water supply hose).
3. Pour 0,1 litre of descaling acid into the water box (2.7).
4. Remove the Turbo Laser lance from the pistol (2.19)
5. Start the cleaner on pos. "1" and allow it to run for ½ minute.
6. Close the pistol (2.19) a couple of times so that the lime scale is removed from the by-pass system.
7. Stop the cleaner and allow the lime scale remover to work for 5 minutes.
8. Re-start the cleaner.

If the pressure does not fall to the operating setting, repeat the process. After removing lime scale, the machine should be run with clean water to remove acid or lime scale residue. Finally, refit the body and Turbo Laser. The cleaner is now ready for use once more.

**Descaling acid is corrosive. The use of face mask and protective gloves is strongly recommended.**

### Frost protection

Like all other water transporting equipment, the high pressure cleaner must be protected against frost.

The best possible protection is to place the machine in a frostfree environment. The machine should not stand near ventilation ducts, open windows, etc. If an extraction flue is fitted, the machine must be removed when not in use as cold air through the flue might freeze the water in the cleaner and cause the boiler coil to burst.

If it is not possible to place the machine in a frostfree environment, it must be protected in the following way:

1. Disconnect the water supply hose (3.3).
2. Remove the body.
3. Start the machine by turning the start/stop knob (2.23) to pos. "1" and allow it to run until the water box (2.7) is empty.
4. Turn the start/stop knob to pos. "0".
5. Pour 2 litres of concentrated anti-freeze liquid into the water box.
6. Start the cleaner on stage "1" and open the pistol.
7. When half the antifreeze liquid has been sucked in, close the pistol a couple of times to ensure that the liquid will protect the by-pass valve. Use the rest of the liquid and then switch off the cleaner.
8. Drain the pre-heater (3.2) and replace the plug.
9. The high pressure cleaner is now protected against frost.

The anti-freeze liquid can be collected and used again.

### Cleaning

Always keep the machine clean. This will increase the life and maintain the functional ability of parts significantly.

# FAULTFINDING

Symptoms	Cause	Remedy
The high pressure cleaner does not start.	Start/stop knob not activated. The high pressure cleaner is not connected to the electrical supply. Fuse blown.  Phase is missing in electric plug.	Turn knob to position "1".  Put the power plug into the socket, switch on the main switch.  Change it. If it still blows contact service department. Reconnect plug, cf. the electric diagram.
The high pressure cleaner suddenly stops.	Fuse blown.  Low voltage.  Motor too hot.  Working pressure too high (nozzle dirty or wrong nozzle).	Change fuse. If it still blows contact the service department. Extension cable too long contact service department. Turn start/stop knob to position "0" and wait till motor has cooled off. Start machine again. Clean/change nozzle (see "Technical Data")
Motor hums when starting.	Fuse blown.  Defect in the electric supply mains.	Change fuse. If fuse still blows or motor still hums, contact service department. Check the phases in electric plug.
The high pressure hose and the pistol are vibrating.	Air in the pump. Lack of water.	Tighten suction hose again. Clean suction filter. Open the water cock completely.
The by-pass valve is "knocking" or the gauge fluctuates with open pistol.	The nozzle is partially blocked.	Remove and clean front nozzle pressure.
The safety valve begins to function or the pressure of the machine is too high.	Front nozzle is partially blocked. Pressure nozzle partially blocked. Wrong nozzle.	Remove and clean front nozzle pressure. Remove and clean pressure nozzle. Change nozzle (see "Technical Data").
The nozzle does not oscillate.	Turbo Laser dirty. Turbo Laser worn.  Turbo Laser filter blocked. Wrong nozzle.	Dis-assemble and clean Turbo Laser head. Change pressure nozzle and wheel (Service kit). Clean/change filter (see "Maintenance"). Change the nozzle (see "Technical Data").
Turbo Laser leaks between pressure bearing and pressure nozzle.	Gaskets defective.	Leak can seal itself with continuous use. Replace gaskets (Service kit).
No detergent supply.	Empty detergent tank. Detergent filter dirty.	Re-fill. Clean detergent filter.
Boiler smokes.	Water in the fuel.	Empty and clean fuel tank.
The machine suddenly emits steam.	The pump suction side is leaking (takes in air).	Check for leakages - tighten hose rings.

Symptoms	Cause	Remedy
The burner stops during operation.	Fuel tank empty. Thermostat setting too low. Water in fuel.	Fill fuel tank (Note: There must always be fuel in the tank to lubricate the oil pump). Check thermostat setting and correct if necessary. Drain fuel tank and clean.
The burner stops during stops incorrectly with correct working pressure.	Fuel tank empty. Thermostat setting too low.	Fill fuel tank (Note: There must always be fuel in the tank to lubricate the oil pump). Check the thermostat setting and adjust if necessary.
The burner does not start.	Fuel tank empty. Thermostat setting too low. Water in the fuel.	Fill fuel tank (Note: There must always be fuel in the tank to lubricate the oil pump). Check the thermostat setting and adjust if necessary. Empty and clean fuel tank.
The high pressure cleaner does not go to max. pressure/pressure fluctuates.	Water supply failure. The pump suction side leaks (takes in air). High pressure nozzle blocked. Machine needs descaling. High pressure nozzle worn. Air in the system.  Wrong nozzle.	Min. 1 bar/14 psi water pressure, measured during operation, must be applied to the machine. Check for leakages, tighten any hose retaining rings. Remove and carefully clean the nozzle.  Descale the machine (see "Maintenance").  Fit new nozzle (see "Technical Data"). Bleed the cleaner. Open the pressure regulation handle, activate the pistol. Let the machine run until stable pressure has been obtained. Change the nozzle (see "Technical Data").
The Water does not reach operating temperature.	Operating thermostat set too low. Boiler needs descaling.	Check the thermostat setting and adjust if necessary. Descale the machine (see "Maintenance").

# TECHNICAL DATA

<b>Model</b>		<b>H-1900</b>
Operating pressure	bar/psi	80/1150
Equivalent Turbo pressure	bar/psi	135/1960
Equivalent Turbo cleaning power	kW	1.8
Water consumption 1)	l/min	9
Motor output	kW	1.5
Current consumption 1×220-240 V 50 Hz	A	10.5
Fuse 1×220-240 V 50 Hz	A	10-16
Inlet temperature	°C/°F	25/77
Water supply pressure max.	bar/psi	10/145
Water connection	inches	¾
Chemical percentage	%	4
Electric cable	m	8
High pressure hose	m	8
Pump oil "SAE 10W/40"	l	0.17
Turbo Laser pressure nozzle	No.	180771
Cylinders	No. off	3
By-pass pressure	bar/psi	7/100
Opening pressure	bar/psi	100/1450
Temperature, adjustable	°C/°F	45-90/113-194
Heat output	kW	42
Nozzle angle	°	15-20
Fuel consumption	l/h	5.3
Oil nozzle	kg/h-°	3.6/80°H
Oil pressure	bar/psi	11/160
Fuel tank	l	15
Water tank	l	2
Length	mm	780
Height	mm	680
Width	mm	580
Weight, complete	kg	74

1). Water consumption varies with the pressure: Minimum pressure = maximum water consumption.