



ULTIMATE WATER JETTING SOLUTION

HB-200

ELECTRICAL POWERED
HEAVY DUTY HOT WATER
HIGH PRESSURE CLEANER

USER GUIDE & SPARE PARTS MANUAL



www.densin.com

Introductions

Congratulations on your purchase of the **DEN-SIN** High Pressure Cleaner.

Model: HB-200

Read this user manual before you start up your High Pressure Cleaner the first time.

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This machine is a High Pressure Cleaner producing water jet under high-pressure, which is why severe injuries can occur if the safety precautions are not observed. Therefore a full understanding of the contents of this instruction manual is required, in order to prevent injuries to you, objects and persons near-by.

Safety

The following symbols are used in this manual to indicate procedures that if not followed, may results in personal injuries or damage to equipment.



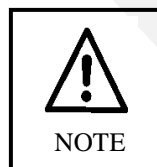
WARNING is used to alert the reader of procedures or practice which if not followed correctly could result in personal injuries.



CAUTION is used to alert the reader of procedures or practice which if not followed correctly could result in damage to machine or other equipment.



NOTE is used to highlight important information that may assist the reader carrying out the procedure or understanding the text.



The information contained in this user guide is subject to change without notice.

Version 00: May 2015

Revision History

Date	Revision	Rev.No.

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1. Getting acquainted with your High Pressure Cleaner

1. Getting acquainted with your High Pressure Cleaner

Fast and efficient cleaning

The **DEN-SIN** high-pressure hot-water cleaners in the HB-200 series enables you to get more cleaning done in less time.

This series of **DEN-SIN** high-pressure cleaners offers you high performance yet a compact design. The compact design enables the machines to be agile within inconvenient places, and the high performance and possibility to use hot water gives you the opportunity to solve an array of cleaning tasks. The high-pressure cleaners in this series are designed for industrial use as well as for cleaning contractors.

Specifications

Model	Working Pressure		Flow Capacity		Power Supply	Dimension LxWxH	Weight
	psi	Bar	gpm	l/min	Voltage	mm	kg
HB-200	2900	200	5.5	21	230 / 1ph / 50Hz	940x650x900	44

Applications

These heavy-duty high-pressure cleaners are capable of removing any kind of dirt:

- Algae off concrete constructions
- Paint and graffiti off walls
- Dust, dirt, soil & mud off floors
- Oil & grease off engines and other mechanical parts
- Dirt and salt deposits off ship decks
- The High pressure cleaner has built in chemical injector

And with the option for use of accessories even many more jobs are to be dealt with:

- Sand-blasting
- Drain-cleaning
- Dispensing of soaps and chemicals
- Floor cleaning equipment
- Rotary brushes



This machine is only to be used for the purposes it is designed for. Any other use shall be considered improper and therefore potentially dangerous. The manufacturer is not to be held responsible for any damages caused by improper use.

1. Getting acquainted with your High Pressure Cleaner

Unpacking

Remove the high-pressure cleaner and its accessories from the packing material. For transport and packing reasons some accessories may be supplied disassembled.

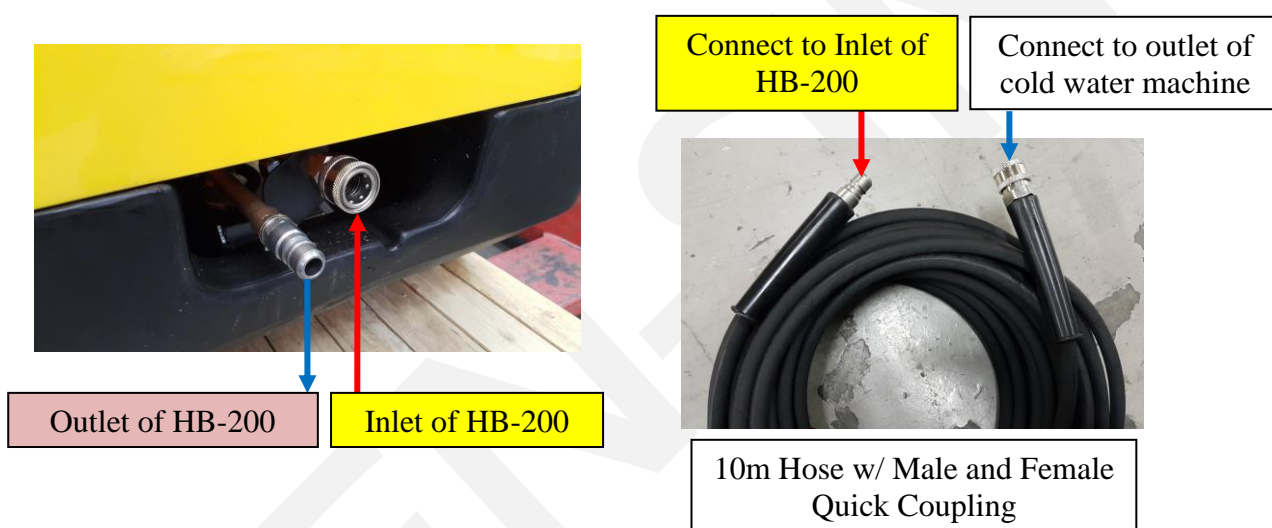
Make sure all components are present:

- Machine
- Electrical cord (attached)
- 10m High pressure hose w/ Male and Female Quick Coupling

Machine Installation / Setup

Step 1: Ensure machine is placed on a flat floor or inclined position not more than 10°.

Step 2: Insert the male quick coupling end of the high pressure hose (included) into the inlet female quick coupling of the machine and connect the female quick coupling end to the outlet of the cold water machine.



Step 3: Connect the complete assembled spray lance and trigger gun of the cold water machine and insert the female quick coupling end to the outlet male quick coupling of the machine.



Step 4: Plug in the power-plug into a main power supply socket and turn on the power. Switch on both the high-pressure cleaner and HB-200 by depressing the on/off switch.

1. Getting acquainted with your High Pressure Cleaner

The high pressure cleaner is now ready for operation. The spray-gun lance will experience a recoil force during operation – therefore keep a firm grip with both hands on the Spray-gun handle and the lance. Press the trigger and start cleaning.

-Pressure can be regulated by adjusting the knob on the spray-gun lance.

-When using the chemical injector, pressure must be adjusted to low.



Make sure your local power supply specifications are in accordance with the motors requirement. Refer to the ID-plate on the machine. Do Not run the High Pressure Cleaner without sufficient potable water supply as it can cause cavitation and serious damage to internal pump parts. Do not let the machine recycle the water (running with Spray-gun trigger not activated) for more than a few minutes as this can cause serious damage to the seals.

Starting up for the 1st time

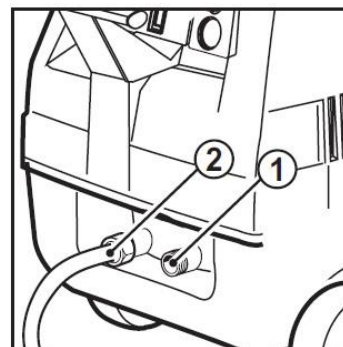
1. Allow water to flow within the machine for about 3 to 5 minutes without turning on the machine to allow any dirt or air to be vented out from the delivery outlet.
2. Ensure the mains voltage is the same as that of the machine printed on the technical data plate.



Failure to comply with the regulations stated above, manufacturer declines all responsibilities for the staff and provides no warranty.

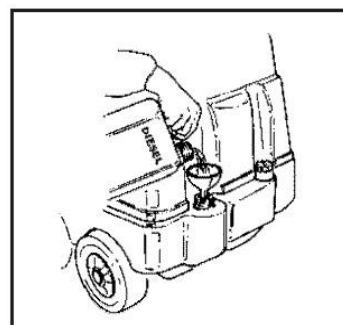
Water Connection

1. Connect the inlet hose to the water mains using the High Pressure hose which comes together with the machine. (**Max Pressure: 200Bar**).



Filling up with Fuel

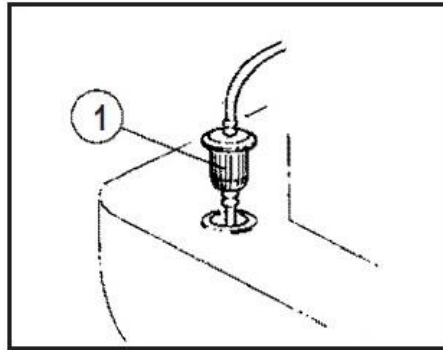
1. Fill the tank with the Diesel.
2. Avoid running the machine when diesel tank is empty in order not to damage the fuel pump.



1. Getting acquainted with your High Pressure Cleaner

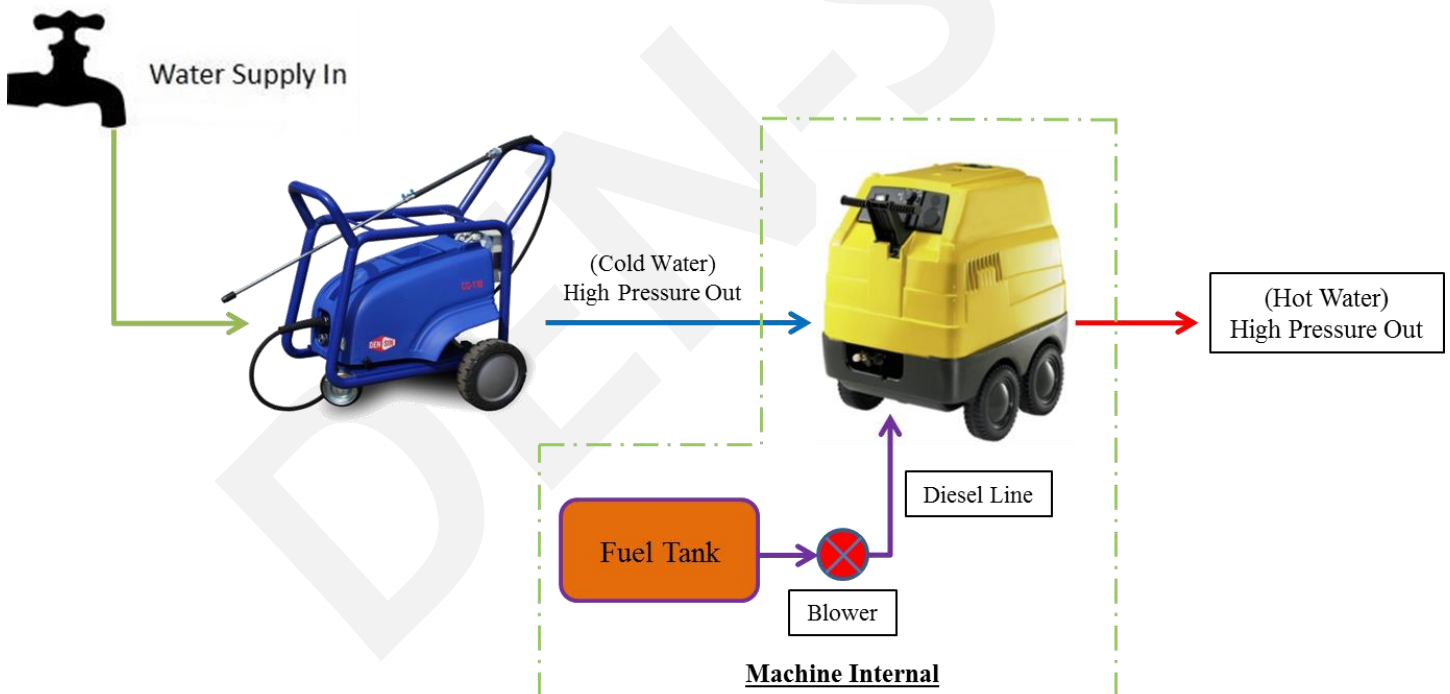
Stopping the Machine

1. Turn the burner thermostat to '0' and wait for the water to cool completely to prevent scale deposits and overheating of the coil and boiler.
2. Ensure electrical cable is not damage. If damage, replace it with approved cable with connections following the wiring diagram as shown in Pg.17.



3. Check fuel filter as shown above periodically and replace when necessary.

Operation Flow Diagram



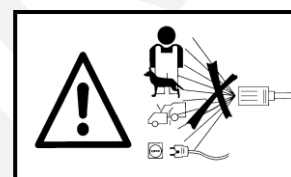
Operation



To prevent accidents from happening, ensure the safety of the person(s) who uses the equipment and to protect bystanders and nearby placed inventory or machinery, a few safety precautions needs attention.

1. Getting acquainted with your High Pressure Cleaner

- 1) Treat the machine as a high-speed cutting tool.
- 2) Anyone under the age of 18 is NOT allowed to use the machine.
- 3) Always use a proper plug and socket specially designed with ground to earth wiring. Only connect to an installation with earth wiring. A certified electrician shall make the installation. It is strongly recommended that the electric supply to the machine include a Residual Current Device/GFCI.
- 4) Always keep the machine and its accessories in good working condition. Check the machine for defects, especially the insulation on the electric cable. Do NOT start up the machine if there is any defect. Have the machine serviced.
- 5) When using the Water Blaster and its accessories, eye protection must be worn to protect against repelling or ricocheting matters causing eye damage.
- 6) Suitable clothing and footwear must be worn while using the equipment to protect the operator. Do not try to clean clothes or footwear with the machine.
- 7) Precautions must be made to keep bystanders away from the working range.
- 8) Do NOT spray-clean on yourself, others or live animals. The high-pressure beams are capable of making severe injuries.
- 9) Do NOT spray at electrical equipment OR the machine itself.
- 10) While repairing or servicing the equipment and its accessories always make sure the machine is turned off and disconnected from the main power supply.
- 11) Only allow instructed personnel to operate the machine.
- 12) Activating the trigger/gun can cause backward force therefore always hold spray lance with both hands.
- 13) When pausing during operation, turned off the main switch of the machine and ensures that the trigger/gun is locked.
- 14) Only use high-pressure hoses, connections and nozzles specified by DEN-SIN.
- 15) **IMPORTANT** – Do not use the machine in a possible explosive environment in accordance with EN-50014.



ID-plate

Refer to the identification plate on the machine:

	DEN-SIN 5 TUAS AVE 2 S(638485) Tel: +65 6288 0006 Fax: +65 6288 4916		Authorized Representative: INLLIFE-ADVANCE A/S Singapore 25 DIC-2605 Brunei City Tel: +45 4323 8100 Fax: +45 4343 7700
HIGH PRESSURE CLEANER			
Model:	<input type="text"/>	Amp:	<input type="text"/>
Item No.:	<input type="text"/>	Noise:	<input type="text"/>
Wet Pres:	<input type="text"/>	Class:	<input type="text"/>
Rated Power:	<input type="text"/>	Inlet °C:	<input type="text"/>
Volt:	<input type="text"/>	IP:	<input type="text"/>
PH:	<input type="text"/>	Mass:	<input type="text"/>
	Freq: <input type="text"/>	Serial:	<input type="text"/>
		Manu:	<input type="text"/>
DESIGNED & MADE IN SINGAPORE			

2. Safety and Protection information

2. Safety and protection information


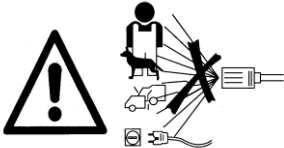
General safety & application guidelines

- 1) It is not allowed to clean asbestos containing surfaces with high-pressure, unless using special equipment.
- 2) Persons under the influence of alcohol, drugs or medicine should not operate the machine.
- 3) Do not touch plug and socket with wet hands.
- 4) This machine has been constructed for use with Nilfisk-ALTO detergents. The use of other detergents or chemicals may cause problems as to the operation and the safety.
- 5) When using detergents the instructions should always be strictly observed.
- 6) Always flush the machine with clean water after use of chemical/detergents.
- 7) Always unplug power supply when cleaning and maintaining the machine.
- 8) Do not use machine if important parts are damaged – i.e. safety devices, high-pressure hoses, spray handle.
- 9) The user is obliged to observe all national working environment and working safety regulations concerning “operation of high-pressure washers”.
- 10) It is not allowed to connect this machine directly to a potable water supply.
- 11) If the machine is to be connected to potable water supply it is strictly necessary to fit the machine with a water break tank, in accordance with EN1717.

Safety devices

The machine is equipped with the following safety devices:

- 1) Stop button. The stop button stops the machine when pushed.
- 2) Locking device on spray-gun handle. The locking device prevents the trigger from being activated when pulled out.
- 3) Thermal sensor and over load relay protects the motor against overloading. The machine can be switched on again after a few minutes, when the sensor has cooled.
- 4) Burner safety devices; the burner safety device protects the machine against faulty ignition.

DO	DON'T
	

3. Maintenance and Troubleshooting

3. Maintenance and troubleshooting

Maintenance

Subject	Matter / Procedure
Cleaning	Use a damp cloth to wipe the cabinet. Do not use detergent cleaning chemicals.

Notice: To prevent electrical shock. **DO NOT SPRAY DIRECTLY UPON THE MACHINE WITH HIGH PRESSURE.**

Occasionally clean the fan cover of the blower to ensure sufficient airflow.

Do NOT operate the machine with damaged or removed fan cover.

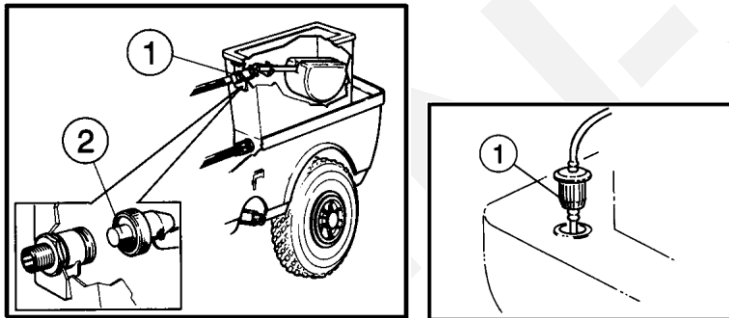
Inspection

To prevent electrical shock and spills of leaking water. Check electrical cord and high-pressure hose for wear and cracks. Keep coupling parts free of dirt to ensure long life of O-ring seals preventing water leak.

Notice: To prevent damage on hoses and cord, be careful not to have them run over by heavy vehicles or squeezed in door openings etc. Replace if necessary.

Storage

Be sure the cleaner is kept frost-free, if not possible flush the inlet of the cleaner with antifreeze fluids.



Depending on water quality, clean the strainer in the water tank regularly.

Depending on Fuel quality clean the fuel filter regularly.

3. Maintenance and Troubleshooting

Troubleshooting

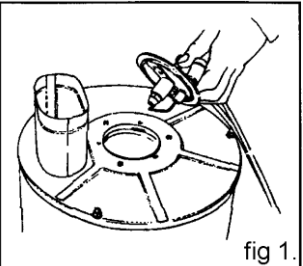
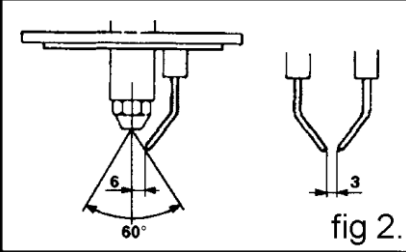
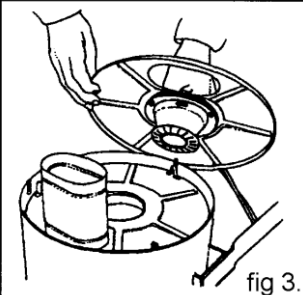
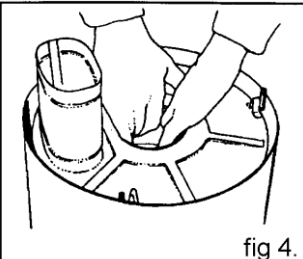
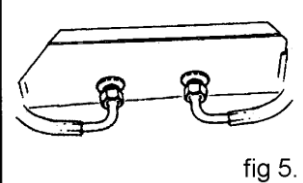
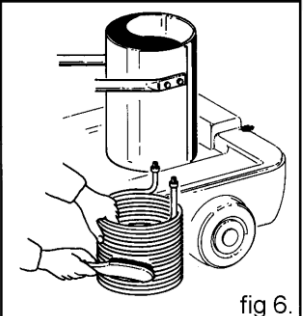
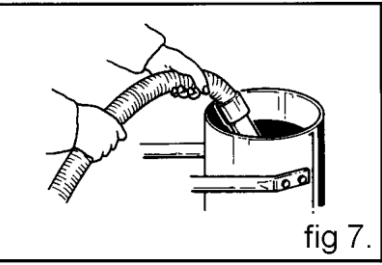
Symptom	Cause and Rectification
When the main switch is turned on the high-pressure cleaner will not run.	<i>Fault somewhere in the power supply.</i> Make sure the socket is inserted correctly. Inspect cord for cracks and wears. Check if fuse is blown, replace if necessary.
The blower motor does not start.	<i>Too low voltage.</i> Check the mains voltage. Check the connection box voltage with a meter. With the machine turned off, turn the motor, at the fan,
The pressure drops and the high-pressure cleaner works irregularly.	<i>The strain filter is clogged or the water supply from the tap is insufficient.</i> Ensure sufficient water-flow through the cold water machine.
The boiler will not burn	<i>The fuel tank is empty. The fuel filter is clogged. The fuel nozzle is clogged. The spark electrodes are worn or out of alignment. The flame censor device is active. The glass between the flame censor and the boiler is dirty.</i> Fill up the fuel-tank. Clean or replace the fuel filter. Clean or replace the fuel nozzle. Adjust or replace the spark electrodes. Reset the device by pushing the reset button at the control panel. Clean the glass between the censor and boiler.
The high-pressure cleaner does not suck chemicals	<i>The chemical container is empty. The high-pressure cleaner has not been set to low-pressure (on the double barrel lance cock). The low-pressure nozzle is clogged, or partly clogged. The non-return valve of the chemical injector is stuck.</i> Ensure the chemical container contains sufficient fluid for proper suction. Set the spray-lance to low pressure by turning the cock on the lance counter-clockwise. Clean or replace the low-pressure nozzle. Clean, correct or replace the non-return valve of the chemical injector.



For any further inconveniences, not mentioned in this user guide or any damages of the machine, we strongly suggest you to make contact with your dealer for the repair or possible replacement of any original spare-parts.

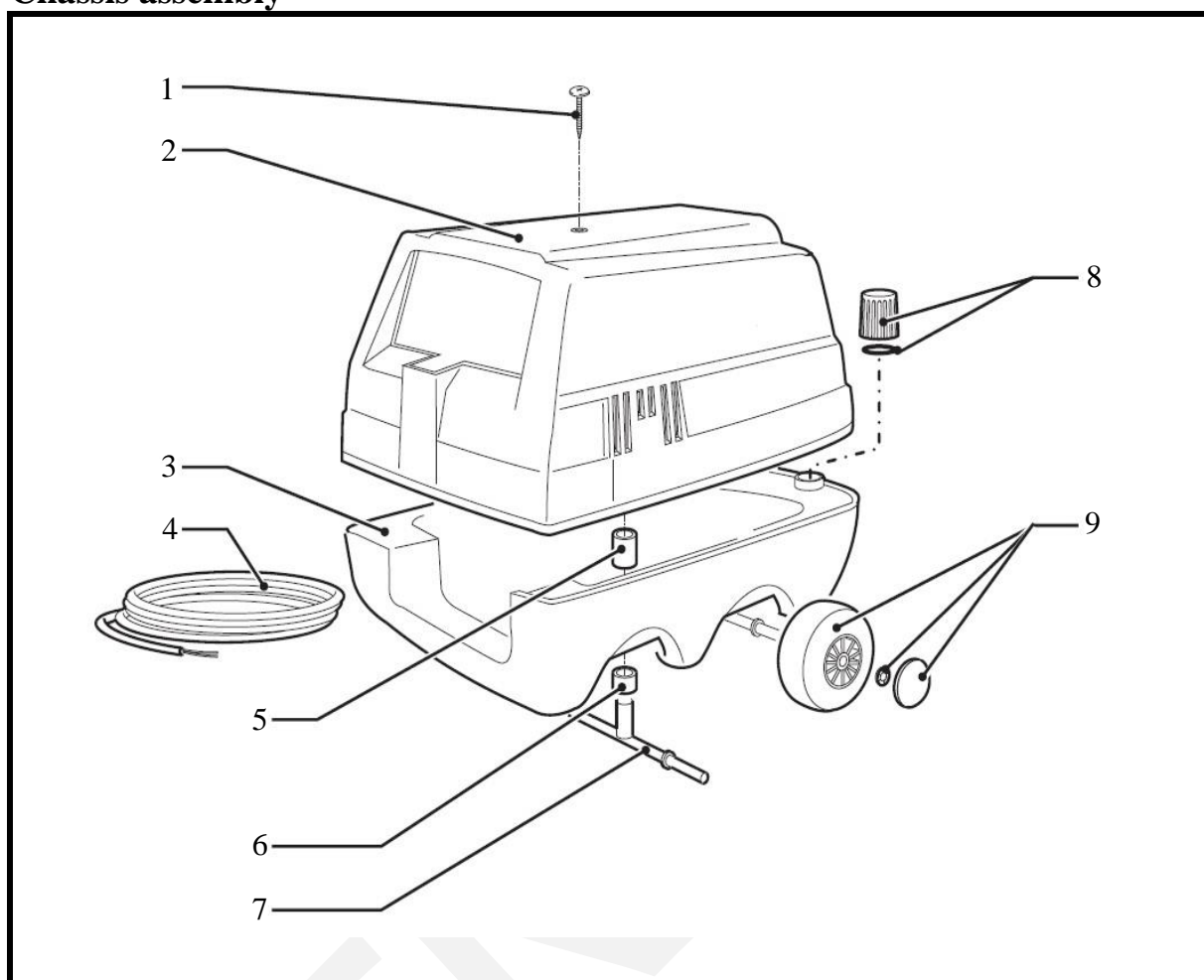
3. Maintenance and Troubleshooting

Boiler Servicing and Maintenance / 200hrs*

 <p>fig 1.</p>	<p>Carefully remove the nozzle holder flange and the electrodes holder (boiler burner head). *Clean the small glass in the flange every 50 hours of use.</p>
 <p>fig 2.</p>	<p>Clean the fuel nozzle filter with compressed air and check the position and wear of the spark electrodes.</p>
 <p>fig 3.</p>	<p>Remove the boiler cap by unscrewing the 3 nuts and clean the deflector with a brush and/or with compressed air.</p>
 <p>fig 4.</p>	<p>Manually take away the interior cap.</p>
 <p>fig 5.</p>	<p>Remove the high pressure hoses and unscrew the locking nuts from beneath. Pull out the boiler coil.</p>
 <p>fig 6.</p>	<p>Clean the boiler coil for residue with a wire brush. Vacuum clean the residue from the boiler housing.</p>
 <p>fig 7.</p>	

4. Accessories List

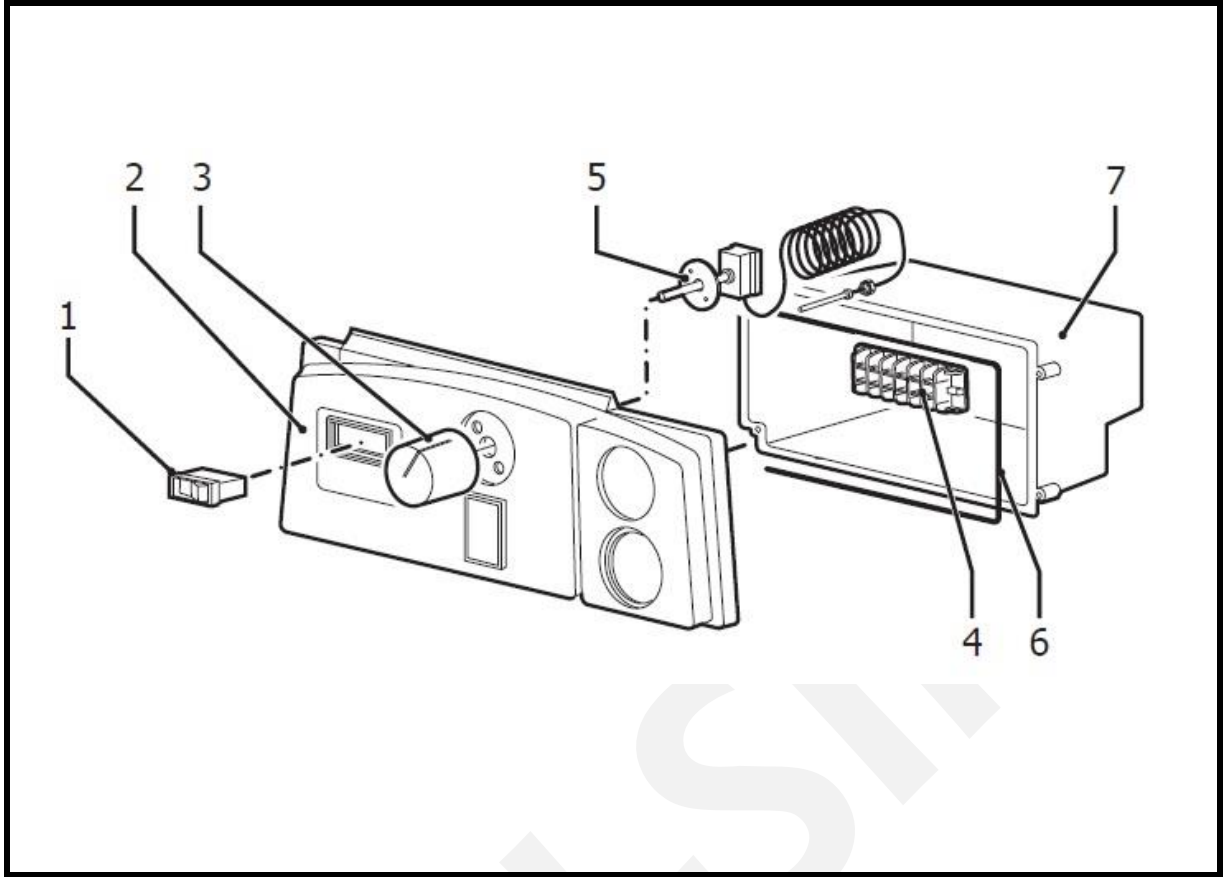
Chassis assembly



Chassis assembly spare-parts list

Pos:	Part No:	Qty:	Description
1	-	1	Screw M6x12
2	700590143	1	Top Cover
3	700590144	1	Diesel Tank
4	700951501	10m	Cable 3G2.5
5	-	4	Long Spacer
6	-	4	Axle Spacer
7	-	2	Wheel Axle
8	700590145	1	Diesel Tank Cap W/Gasket
9	700590060	4	Wheel W/Cover
*	700550042	10m	Hose Extension M-F

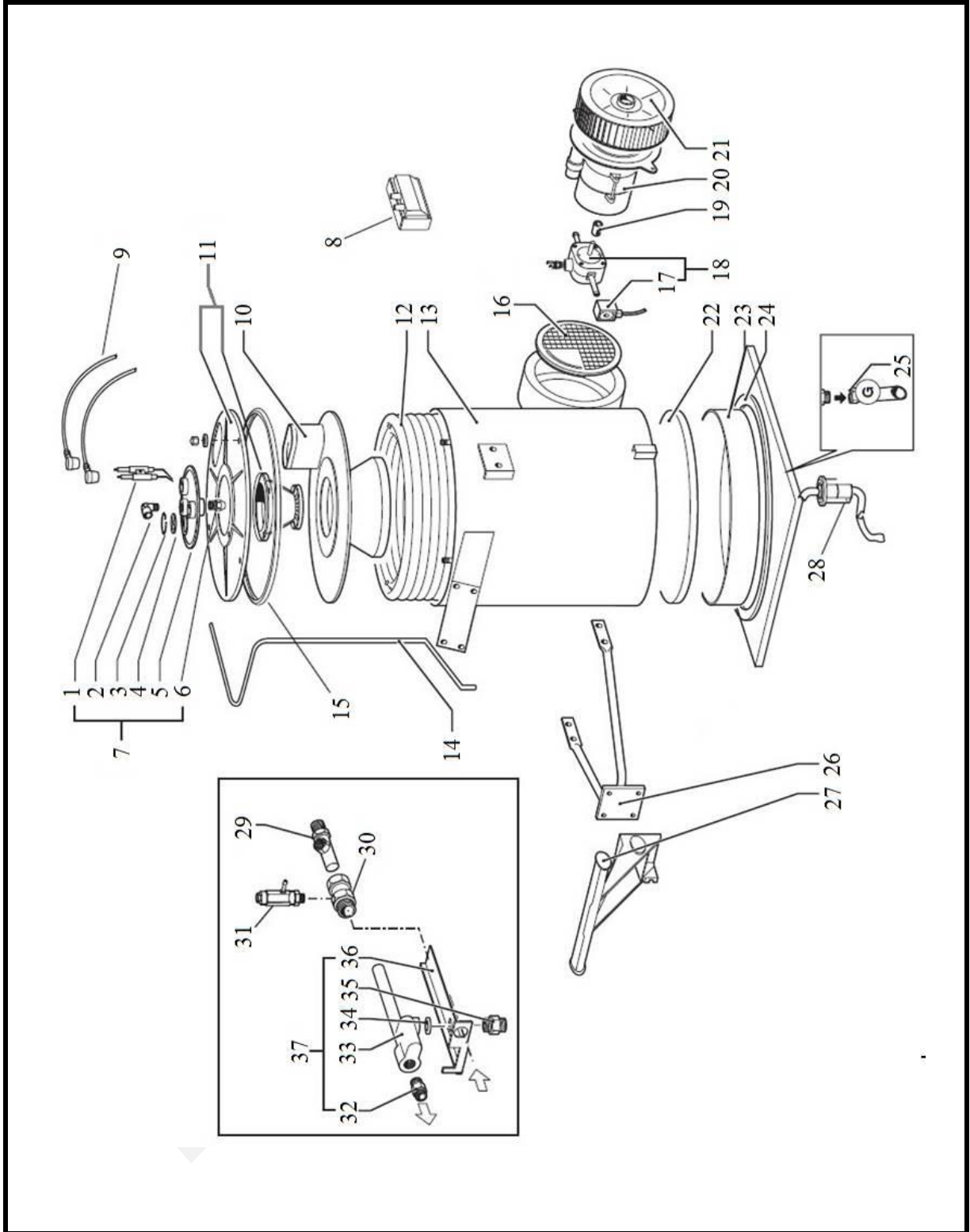
Electrical Box assembly



Electrical Box assembly spare-parts list

Pos:	Part No:	Qty:	Description
1	700590146	1	Switch
2	700590147	1	Control Panel
3	700530266	1	Knob Thermostat
4	700530272	1	TERMINAL BLOCK
5	700530267	1	Thermostat
6	700590148	1	EL-Box Gasket
7	-	1	Electrical Box

Boiler assembly



5. Declaration and Warranty

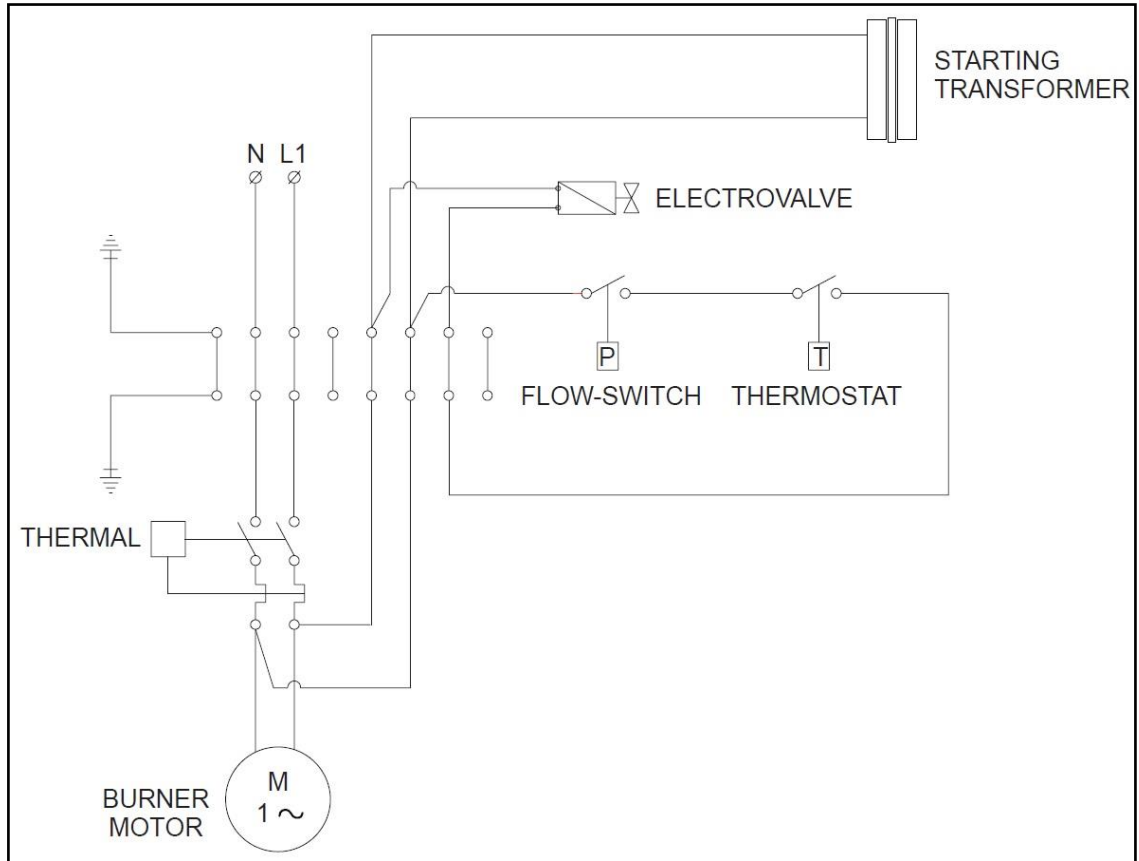
Boiler assembly spare-parts list

Pos:	Part No:	Qty:	Description
1	700590039	1	Ignition Electrode
2	700590025	1	Elbow Dia.4 – 1/8”
3	-	1	Ring Seeger
4	700590003	1	Sight Glass
5	-	1	Wrought Burner Flange
6	-	1	Diesel Nozzle 1.50
7	700590149	1	Boiler Flange Complete
8	700590150	1	Ignition Transformer HB-200
9	700590027	2	Electrode L=480mm
10	700590151	1	Chimney Inward Cover
11	700590099	1	Burner Cover
12	700590152	1	Upper Coil H.500
13	700590153	1	Boiler Body
14	700590154	1	Copper Pipe
15	-	1	Band for Burner Cover
16	700590006	1	Fan Protection Cage
17	700590028	1	Blower Coil
18	700590044	1	Fuel Pump Coil
19	-	1	Plastic Coupling
20	700590046	1	Blower Motor 50Hz
21	700590008	1	Blower Fan
22	700590031	1	Refractory Bottom
23	700590043	1	Coil Fixing Strip Plate
24	700590036	1	Insulating Rope for Boiler Base
25	700590155	1	Tube R2
26	-	1	Handle Bracket
27	-	1	Handle
28		1	Oil Filter Unit
29	700590156	1	Flow Switch 3/8”
30	700590157	1	Pivoting Connection
31	700590158	1	Safety Valve 250Bar
32	700540026	1	Quick Coupling 3/8” M
33	-	1	Bulb Assembly
34	-	1	Aluminium Washer
35	-	1	Coupling Nipple 1/2" – 3/8”
36	-	1	Bulb Bracket
37	700590076	1	Bulb Assembly Complete

5. Declaration and Warranty

Wiring diagrams


HB-200E 230V 50Hz Standard



5. Declaration and Warranty

5. Declaration and Warranty

EU declaration of conformity

	EU Declaration of Conformity
Product:	Electric powered Heavy duty Hot Water high-pressure cleaner
Type:	HB-200 50Hz
Description:	230V 0~ 50Hz, IP 54 200 [bar] 20 [MPa]
The design of the unit corresponds to the following pertinent regulations:	EC Machine Directive 2006/42/EC EC EMC Directive 2004/108/EC
Applied harmonized standards:	EN 12100-1, EN 12100-2, EN 1829-1/EN 60335-2-79 EN 55014-1, EN 55014-2, EN 61000-3-2
Applied national standards and technical specifications:	DIN EN 60335-2-79 DEN-SIN – a division Nilfisk-Advance Pte Ltd. No 5 Tuas Ave 2 Singapore 639445 Tel: +65 62681006 Fax: +65 62684916 Singapore, Jan 2014

Warranty

DEN-SIN warrants all equipment of its manufacture furnished under this agreement to be free from defect in workmanship and material for a period of one year from the date of invoice of the equipment. This warranty does not cover normal wear and tear, consumable items, or part failures caused by (i) accident, (ii) abuse, or (iii) failure to maintain the DEN-SIN system containing the affected parts in accordance with DEN-SIN technical specification. All labour is the responsibility, and the expense of the Buyer. The liability of Seller under this warranty is limited, at Seller's option, solely to repair or replacement with equivalent articles. This warranty is condition upon (a) Seller being notified in writing by Buyer within one week after discovery of defects;

(b) the return of defective articles to Seller, transportation charges prepaid by Buyer; and (c) Seller's examination of such article disclosing to its satisfaction that such defects were not caused by negligence, misuse, improper maintenance, improper installation, accident, or unauthorized repair or alteration.

Accessories or equipment furnished by DEN-SIN but manufactured by others, shall carry the warranty that its manufacturer has conveyed to DEN-SIN, and which may be passed on to the purchaser. The original warranty period of any article, which has been repaired or replaced by DEN-SIN, shall not thereby be extended.

6. Spare Parts Request Form

6. Spare Parts Request Form

Company Name: _____

Delivery Address: _____

Country: _____

Postal Code: _____

Contact Name: _____

Contact Number: _____

Fax Number: _____

Mobile Number: _____

Email: _____

S/N	Part Number	Description	QTY	Machine Model or Serial Number
1				
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Special Instructions: _____

7. Maintenance Log Book

7. Maintenance Log Book

This maintenance logbook will assist you to keep track on the servicing of your equipment. Please record after service your machine.

Purchase date of the machine:

S/N	Service Description	Date	Remarks
1			
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