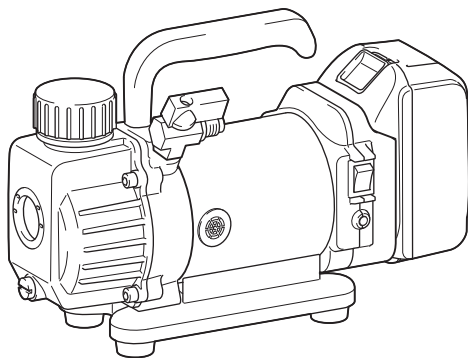
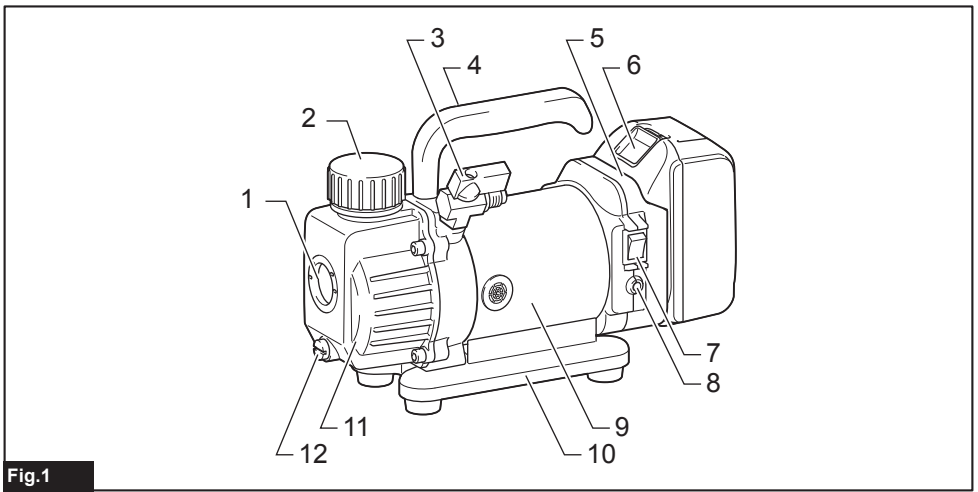
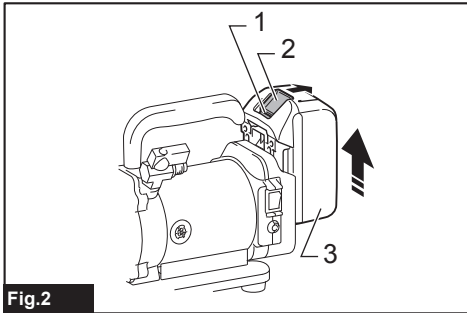


## DVP180

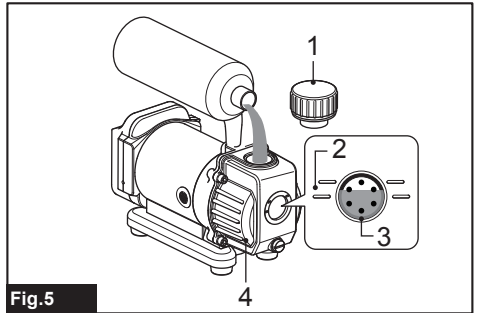




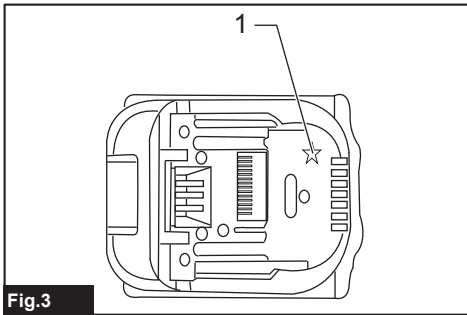
**Fig.1**



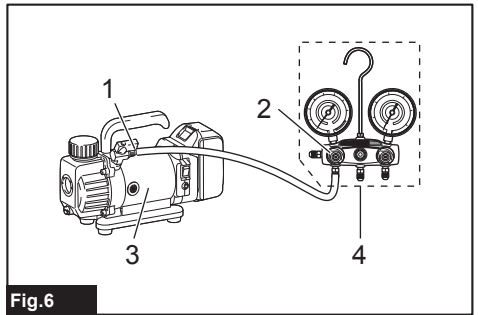
**Fig.2**



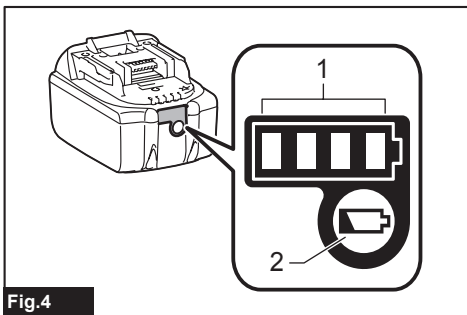
**Fig.5**



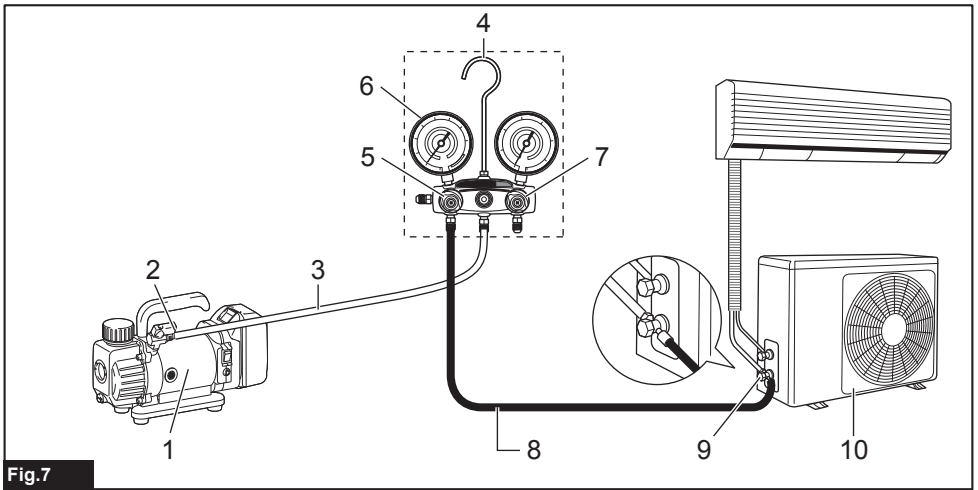
**Fig.3**



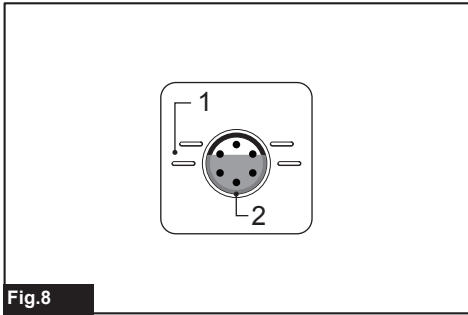
**Fig.6**



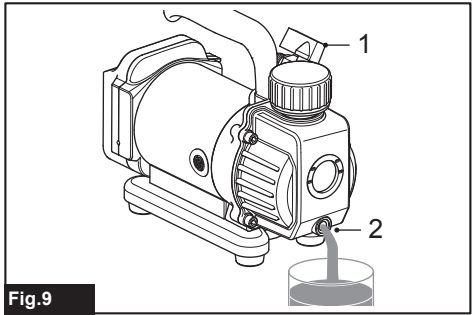
**Fig.4**



**Fig.7**



**Fig.8**



**Fig.9**

# SPECIFICATIONS

Model:	DVP180
Battery cartridge (capacity)	BL 1860B (6.0 Ah) BL 1850 / BL 1850B (5.0 Ah) BL 1840 / BL 1840B (4.0 Ah) BL 1830 / BL 1830B (3.0 Ah)
Rated voltage	D.C. 18 V
Pump	Single stage rotary pump
Free air displacement	50 L/min
Ultimate vacuum	20 Pa
Oil capacity	100 – 115 ml
Intake	5/16" flare male
Dimensions	263 mm (L) × 93 mm (W) × 172 mm (H)
Net weight (with the BL1850 battery)	3.5 kg

- Due to our continuing program of research and development, the specifications herein are subject to change without notice.
- Specifications and battery cartridge may differ from country to country.
- Weight, with battery cartridge, according to EPTA-Procedure 01/2003

Vacuum pump for air evacuation of closed systems (air conditioners, tanks, etc).

This equipment is specially designed for HVAC&R systems.

The single stage of these pumps make it feasible to achieve the final vacuum level requested.

Big sight glass and low oil level design avoids running without oil and ensures reliable usage.

Besides, the check valve avoids any oil mixture due to the backflow after a power interruption or any other process interruption.

## Symbols

The following show the symbols used for the equipment. Be sure that you understand their meaning before use.



- Read instruction manual.



- **Warning: hot surface!**  
Do not touch around this symbol. Touching the surface may cause burns or injuries.



- Only for EU countries  
Do not dispose of electric equipment or battery pack together with household waste material!

In observance of the European Directives, on Waste Electric and Electronic Equipment and Batteries and Accumulators and Waste Batteries and Accumulators and their implementation in accordance with national laws, electric equipment and batteries and battery pack(s) that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

## EC DECLARATION OF CONFORMITY

For European countries only

The EC declaration of conformity is included as Annex A to this instruction manual.

## General power tool safety warnings

**⚠ WARNING: Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

## Save all warnings and instructions for future reference.

The term “power tool” in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

### Work area safety

1. **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

## Electrical safety

4. **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
5. **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
6. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
7. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
8. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
9. **If operating a power tool in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of an GFCI reduces the risk of electric shock.

## Personal safety

10. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
11. **Use personal protective equipment. Always wear eye protection.** Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
12. **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.
13. **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
14. **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
15. **Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving parts.
16. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

## Power tool use and care

17. **Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for which it was designed.

18. **Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
19. **Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.
20. **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.
21. **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools.
22. **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
23. **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

## Battery tool use and care

24. **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
25. **Use power tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.
26. **When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.
27. **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.

## Service

28. **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.
29. **Follow instruction for lubricating and changing accessories.**
30. **Keep handles dry, clean and free from oil and grease.**

## Cordless vacuum pump safety warnings

Read carefully instructions in the literature, strict observance of procedures is main condition for operator safety.

1. The vacuum pump is a machine used to evacuate refrigeration and air conditioning equipment and recovery vessels. Do not use it for other applications. Doing so may result in accidents.
2. Always inspect the vacuum pump for oil leaks before use. Failure to do so may result in fire.
3. Check the oil level and condition (deterioration, etc.) to enable safe and efficient work.
4. Wear safety glasses and gloves when handling refrigerant; avoid contact with refrigerant, blindness and injuries may result to operator.
5. Adequate performance may not be obtained in extremely hot or cold environments.

## SAVE THESE INSTRUCTIONS.

**⚠WARNING:** DO NOT let comfort or familiarity with product (gained from repeated use) replace strict adherence to safety rules for the subject product.

MISUSE or failure to follow the safety rules stated in this instruction manual may cause serious personal injury.

## Important safety instructions for battery cartridge

1. Before using battery cartridge, read all instructions and cautionary markings on (1) battery charger, (2) battery, and (3) product using battery.
2. Do not disassemble battery cartridge.
3. If operating time has become excessively shorter, stop operating immediately. It may result in a risk of overheating, possible burns and even an explosion.
4. If electrolyte gets into your eyes, rinse them out with clear water and seek medical attention right away. It may result in loss of your eyesight.
5. Do not short the battery cartridge:
  - (1) Do not touch the terminals with any conductive material.
  - (2) Avoid storing battery cartridge in a container with other metal objects such as nails, coins, etc.
  - (3) Do not expose battery cartridge to water or rain.A battery short can cause a large current flow, overheating, possible burns and even a breakdown.
6. Do not store the tool and battery cartridge in locations where the temperature may reach or exceed 50°C (122°F).
7. Do not incinerate the battery cartridge even if it is severely damaged or is completely worn out. The battery cartridge can explode in a fire.

8. Be careful not to drop or strike battery.
9. Do not use a damaged battery.
10. Follow your local regulations relating to disposal of battery.

## SAVE THESE INSTRUCTIONS.

**⚠CAUTION:** Only use genuine Makita batteries. Use of non-genuine Makita batteries, or batteries that have been altered, may result in the battery bursting causing fires, personal injury and damage. It will also void the Makita warranty for the Makita tool and charger.

## Tips for maintaining maximum battery life

1. Charge the battery cartridge before completely discharged. Always stop tool operation and charge the battery cartridge when you notice less tool power.
2. Never recharge a fully charged battery cartridge. Overcharging shortens the battery service life.
3. Charge the battery cartridge with room temperature at 10°C - 40°C (50°F - 104°F). Let a hot battery cartridge cool down before charging it.
4. Charge the battery cartridge if you do not use it for a long period (more than six months).

## PARTS DESCRIPTION

► Fig.1:

- |                          |                 |
|--------------------------|-----------------|
| 1. Sight glass           | 7. Power switch |
| 2. Oil fill/Exhaust cap  | 8. LED lamp     |
| 3. Intake shut-off valve | 9. Motor        |
| 4. Handle                | 10. Base        |
| 5. Battery holder        | 11. Oil tank    |
| 6. Battery               | 12. Drain plug  |

## FUNCTIONAL DESCRIPTION

**⚠CAUTION:** Always be sure that the pump is switched off and the battery cartridge is removed before adjusting or checking function on the pump.

## Installing or removing battery cartridge

**⚠CAUTION:** Always switch off the pump before installing or removing of the battery cartridge.

**⚠CAUTION:** Hold the pump and the battery cartridge firmly when installing or removing battery cartridge. Failure to hold the pump and the battery cartridge firmly may cause them to slip off your hands and result in damage to the pump and battery cartridge and a personal injury.

► Fig.2:

1. Red indicator
2. Button
3. Battery cartridge

To remove the battery cartridge, slide it from the pump while sliding the button on the front of the cartridge.

To install the battery cartridge, align the tongue on the battery cartridge with the groove in the housing and slip it into place. Insert it all the way until it locks in place with a little click. If you can see the red indicator on the upper side of the button, it is not locked completely.

**CAUTION:** Always install the battery cartridge fully until the red indicator cannot be seen. If not, it may accidentally fall out of the pump, causing injury to you or someone around you.

**CAUTION:** Do not install the battery cartridge forcibly. If the cartridge does not slide in easily, it is not being inserted correctly.

Indicator lamps			Remaining capacity
Lighted	Off	Blinking	
			75% to 100%
			50% to 75%
			25% to 50%
			0% to 25%
			Charge the battery.
			The battery may have malfunctioned.

**NOTE:** Depending on the conditions of use and the ambient temperature, the indication may differ slightly from the actual capacity.

## Battery protection system

► Fig.3:

1. Star marking

The pump is equipped with a battery protection system. This system automatically cuts off power to the motor to extend battery life.

The pump will automatically stop during operation if the pump and/or battery are placed under one of the following conditions:

**Overloaded:**

The pump is operated in a manner that causes it to draw an abnormally high current.

In this situation, turn the pump off and stop the application that caused the pump to become overloaded. Then turn the pump on to restart.

If the pump does not start, the battery is overheated.

In this situation, let the battery cool before turning the pump on again.

**Low battery voltage:**

The remaining battery capacity is too low and the pump will not operate. In this situation, remove and recharge the battery.

**NOTE:** The overheat protection works only with a battery cartridge with a star marking.

## Indicating the remaining battery capacity

**Only for battery cartridges with "B" at the end of the model number**

► Fig.4:

1. Indicator lamps
2. Check button

Press the check button on the battery cartridge to indicate the remaining battery capacity. The indicator lamps light up for few seconds.

## OPERATION

The pump does not contain oil when newly purchased. Refer to "Adding oil" and add oil.

**WARNING:** Operating the pump in the condition without oil added will damage the pump. In addition, the oil tank will become hot and may result in burns or other accidents.

## Adding oil

► Fig.5:

1. Oil fill/Exhaust cap
2. Level line
3. Sight glass
4. Oil tank

1. Remove the oil fill/exhaust cap and add the supplied oil via the filler port.

**NOTICE:** Always use Makita genuine oil in order to maintain pump performance.

2. Add oil until the oil level is between the upper and lower level lines of the sight glass.

**NOTICE:** The oil level is important. Operating the pump in the condition with the oil level not between the upper and lower level lines may result in malfunction.

## Checking performance

► Fig.6:

1. Intake
2. Low side valve
3. Vacuum pump
4. Manifold

1. Connect the low side valve of the manifold and the intake port of the pump with a charging hose.
2. Close the low side valve of the manifold.
3. Open the intake shut-off valve.

4. Open the inlet valve.
5. Turn the pump on. If the pressure of the manifold indicates a vacuum of -0.09 to -0.1 MPa within 30 seconds, the pump is operating properly.
6. Turn the pump off.

## Operation

### ► Fig.7:

- |                           |                                     |
|---------------------------|-------------------------------------|
| 1. Vacuum pump            | 6. Low pressure gauge               |
| 2. Intake shut-off valve  | 7. High side valve                  |
| 3. Charging hose (yellow) | 8. Charging hose (blue)             |
| 4. Manifold               | 9. Service port (Low pressure side) |
| 5. Low side valve         | 10. Outdoor unit                    |
1. Connect the pump, manifold and outdoor unit with hoses.

**NOTE:** When the size of the service port on the unit is 1/4", use the supplied different diameter adapter.

2. Check that the high side and low side valves of the manifold are closed.
3. Install the battery to the pump. (See "Installing or removing battery cartridge" for the installation method.)
4. Turn the pump on. The LED lamp (green) lights up.
5. Open the intake shut-off valve of the pump and the low side valve of the manifold.

**⚠WARNING:** The pump becomes hot during operation and immediately after stopping. Do not touch the pump while it is hot. Doing so may result in burns or other accidents.

**NOTE:** The motor may not operate when it is cold (5°C or less). In these cases, bring the pump indoors and allow it to warm up.

6. When the specified vacuum (refer to the manual provided by the air conditioner manufacturer) is reached, close the low side valve of the manifold.
7. Close the intake shut-off valve and turn the pump off.

### Airtightness test

There are no leaks if the pressure of the manifold does not rise for 5 minutes or more after leaving the pump and manifold.

**NOTE:** When the battery remaining capacity becomes low, LED lamp goes out and at the same time a long alarm beep start sounding. About two minutes later the motor stops. And then alarm beep changes into a repeated short-time interval beeping which notifies the motor stop and 30 seconds later the beeping stops. However, do not wait until the motor stops (or alarm beep changes to a short-time beeping), and instead close the inlet valve of the pump and the low pressure side valve of manifold.

Check that the pump is turned off, remove the battery, and charge it or replace it with a spare battery.

- Refer to the following table for the battery operation times.

## Operation times (guideline)

Battery	Operation times
BL1860B	75 min
BL1850 / BL1850B	50 min
BL1840 / BL1840B	40 min
BL1830 / BL1830B	30 min

- After finishing work, remove the battery and attach the supplied cover.

**NOTICE:** When transporting, operating and storing the pump, never place it on its side or upside down. This may cause oil leakage from the oil filler/vent cap.

## Transport and storage

- Always drain your vacuum pump of all fluids before shipping to prevent the damage of the container.
- Always cover the intake port with cap to keep any dust from entering the pump.
- Be sure that the pump is kept in a horizontal position.
- The pump is stored in indoor ambient temperature 5°C – 40°C .

## MAINTENANCE

**⚠CAUTION:** Always be sure that the pump is switched off and the battery cartridge is removed before attempting to perform inspection or maintenance.

**NOTICE:** Never use gasoline, benzine, thinner, alcohol or the like. Discoloration, deformation or cracks may result.

To maintain product SAFETY and RELIABILITY, repairs, any other maintenance or adjustment should be performed by Makita Authorized or Factory Service Centers, always using Makita replacement parts.

### Stop the pump:

To make pump life longer and smooth start-up, these procedures to shut off pump should be followed.

1. Close the manifold valve between the pump and the system.
2. Remove the hose from the pump inlet.

Cover the inlet port opening to prevent any contamination or foreign particles from entering the port.

## Checking the oil

### ► Fig.8:

1. Level line
2. Sight glass

- Always check the oil level and condition (deterioration, etc.) before using the pump.

**NOTE:** Add oil until the oil level is between the upper and lower level lines of the sight glass.



## Replacing the oil

### ► Fig.9:

1. Intake shut-off valve    2. Drain plug
1. Open the intake shut-off valve.
2. Operate the pump for 1 or 2 minutes to warm up the oil.
3. Turn the pump off.
4. Remove the drain plug and drain the oil.
5. Refer to "Adding oil" and add new oil.
- Dispose of the old oil in accordance with local regulations.

**NOTE:** It is recommended to change the oil after 20 hours of usage to protect pump components from contaminants pulled into the pump.

When vacuuming on old refrigeration systems, change the oil after every usage.

### Vacuum pump oil:

The condition and type of oil used in any high performance vacuum pump are extremely important in determining the ultimate attainable vacuum. It is recommended to use the High Performance Vacuum Pump Oil, which is specifically blended to maintain maximum viscosity at normal temperatures and to improve start up under cold weather.

## Cleaning the pump

1. When the oil is extremely dirty, replace the oil and then operate the pump for 3 to 5 minutes.
2. Drain the oil and add new oil.  
If the drained oil is still dirty, repeat this cleaning process two or three times.

## Troubleshooting

Condition	Possible Cause	Solution
The pump will not start.	<ol style="list-style-type: none"> <li>1. The battery is not set properly.</li> <li>2. The ambient temperature is too low.</li> <li>3. Poor wiring connection.</li> <li>4. The pump is locked.</li> <li>5. Motor failure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set the battery properly.</li> <li>2. Warm up the pump in doors.</li> <li>3. Repair.</li> <li>4. Repair.</li> <li>5. Repair.</li> </ol>
The pump will not enough vacuum.	<ol style="list-style-type: none"> <li>1. Leaking from the system.</li> <li>2. Insufficient oil.</li> <li>3. Dirty oil.</li> <li>4. Pump parts are worn out.</li> <li>5. Damaged fittings, gaskets and seal.</li> <li>6. Motor failure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair the system.</li> <li>2. Refill or change oil.</li> <li>3. Clean reservoir and change oil.</li> <li>4. Repair.</li> <li>5. Repair.</li> <li>6. Repair.</li> </ol>
Oil leakage.	<ol style="list-style-type: none"> <li>1. Damaged gaskets and shaft seals.</li> <li>2. Damaged O-ring of oil drain plug.</li> <li>3. Oil drain plug is loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair.</li> <li>2. Replace O-ring.</li> <li>3. Tighten Oil drain plug.</li> </ol>
Abnormal noise.	<ol style="list-style-type: none"> <li>1. Motor failure.</li> <li>2. Bearing failure.</li> <li>3. Loose bolts.</li> <li>4. Pump failure.</li> <li>5. Air is sucked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair.</li> <li>2. Repair.</li> <li>3. Tighten bolts.</li> <li>4. Repair.</li> <li>5. Tighten caps and connections. Replace gaskets and O-rings. Replace fittings or re-seal them.</li> </ol>

Remark: If these procedures do not solve the problem, contact with your nearest Makita authorized distributor or send your pump to our service center.

# OPTIONAL ACCESSORIES

**⚠ CAUTION:** These accessories or attachments are recommended for use with your Makita tool specified in this manual. The use of any other accessories or attachments might present a risk of injury to persons. Only use accessory or attachment for its stated purpose.

If you need any assistance for more details regarding these accessories, ask your local Makita Service Center.

- Makita genuine batteries and chargers
- Vacuum pump oil 150 ml
- Vacuum pump aluminum case
- Vacuum pump hose
- Vacuum pump valve with gauge

**NOTE:** Some items in the list may be included in the tool package as standard accessories. They may differ from country to country.

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3070 Kortenberg, Belgium

**Makita Corporation** 3-11-8, Sumiyoshi-cho,  
Anjo, Aichi 446-8502 Japan

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