

OPERATORS MANUAL



DRAMM

BP-4

Produced By
DRAMM CORPORATION
P.O. Box 1960 • 2000 North 18th Street
Manitowoc, Wisconsin 54221-1960
www.dramm.com

IMPORTANT:

**READ AND FOLLOW ALL INSTRUCTIONS BEFORE OPERATING SPRAYER.
FAILURE TO DO SO COULD RESULT IN INJURY.**

Thank you for purchasing this product.

This operation manual explains the correct handling method, simple checks, and maintenance of this product. Please read this manual carefully, understand its contents, and use it to maintain the superior performance of this product.

Keep this manual after you read it, for use in extended operation. Note that discrepancies between the actual product and the content of this manual may be found as we are continually making improvements to provide better quality products to our customers.

Please send any inquiries about this product to your nearest sales outlet or sales office.

- Please keep this operation manual
- If you lose this operation manual, purchase a replacement at your nearest sales outlet or our sales office.
- Modifying this product prevents safe and comfortable operation, and is very dangerous.

Contents

1. In Order to Work Safely

Cautions prior to work
Confirmation of standard parts
Name of each part
Cautions when using the product
Check prior to work
Cautions during operation
Precautions after use
Functions of the operation section

2. Handling and Operating Methods

Nozzle assembling
Battery remainder determination method
Dispensing chemicals
Starting
Stopping
Switching the pressure regulating valve
Method for using the measuring cup

3. Cleaning, Recharging, and Storage

Cleaning the inside of chemical tank
Cleaning the pump side with water
Cleaning the strainer
Water draining
Recharging the battery
Consumption parts list
The battery

4. Troubleshooting and Remedies



This symbol accompanied by the words **WARNING** and **DANGER** calls attention to an act or condition that can lead to serious personal injury to operator and bystanders.

WARNINGS

In this manual, important handling cautions are indicated as follows:

DANGER Death or serious injury may occur when not complying with the warning.

WARNING Possibly death or serious injury may occur when not complying with the warning

CAUTION Possibly injury may occur when not complying with the warning

CAUTION Machine will possibly be damaged if not complying with the warning.

WARNING LABEL

- Always remove dirt or mud to make the indications legible
- The following alarm labels are attached:

Read operation manual thoroughly

Make sure you read the operation manual thoroughly prior to use.

Wear personal protective equipment

Wear protectors such as hat, safety glasses, and ear plugs during work.

Prohibition of fire

Do not put a naked flame close to a place where store machine or are doing maintenance

Cautions for electrical shock

There is danger of electric shock during operation, so do not touch the electric parts.

I. In Order to Work Safely



Cautions prior to work

Wear proper work clothes and protective gear

Do not allow the following persons to perform spraying:

- A person who cannot perform normal spraying operation because of extreme fatigue due to overwork, disease, drug side-effect, or other similar reason
- Drunk person
- Pregnant women
- Persons not responsible for the spraying work.

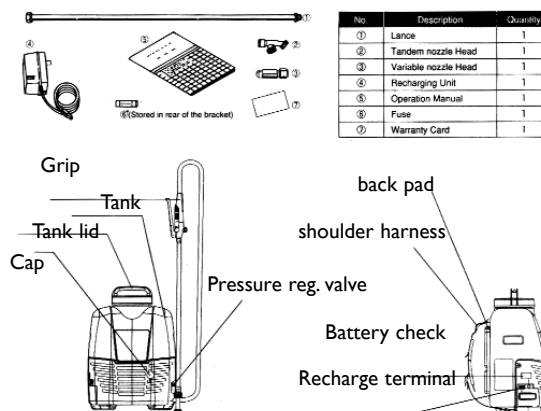
WARNING

Regularly inspect and maintain these protective items to ensure that they work normally and use them properly.

Confirmation of standard parts

After opening the package, confirm that all accessories are present.

If accessories are missing or damaged inform the sales outlet where you purchased the product.



Cautions when using this product

This product can be used for the following agricultural work. Avoid use for purposes other than those listed :

1. Spraying chemicals for blight or harmful insect on general farm crops
2. Spraying chemicals for blight or harmful insect on fruit trees
3. Spraying chemicals for blight or harmful insects on crops cultivated in greenhouses
4. Spraying chemicals for blight or harmful insects on flowers
5. Spraying disinfecting liquid or insecticide on farm house or chicken house
6. Spraying chemicals and water for blight or harmful insects on garden trees, bonsai, or lawns
7. Spraying disinfecting liquid and insecticide for urban sanitation
8. Spraying chemicals for blight or harmful insects on flower beds and in parks
9. Spraying weed killer to control weeds
10. Spraying water for cleaning vegetables or root vegetables

When transporting by automobile, take action to prevent the machine from falling.

Check Prior to Work

When transporting this unit by vehicle, take necessary measures to prevent damage due to falling

When loading and unloading heavy objects, avoid unnatural posture and do not work alone- employ assistance

Conduct inspection, maintenance services and cleaning in a level area

Ensure that each joint has securely fastened nuts and bolts and all covers are tightly closed to avoid damage or injury

Protect electric wiring from oil, water and fire

Caution

Do not use this machine when there are people, especially children, near the site

Always adopt a safe working posture when carrying tank to avoid lower back injury

Do not work at elevated sites using stairs or ladders while carrying the BP-4

Chemicals

- Read labels of the chemicals to be used carefully and understand the method of use and warnings. Spraying incorrect agricultural chemicals or incorrectly mixed chemicals can cause damage.
- Store chemicals in a safe place, and be careful not to break open their containers during transportation.
- Respect chemical containers to ensure safety.
- Pay attention to the handling of chemicals. If a chemical enters into an eye or the mouth, wash it off with water immediately.
- If you feel ill, see a doctor immediately.
- According to wind direction, change the spraying method to protect workers and houses. When spraying chemicals, work from upwind to downwind. Also give consideration to prevent chemicals from drifting or scattering on crops, enclosures, fish-breeding ponds, and houses nearby.
- When working in a greenhouse, pay attention to ventilation.
- When preparing chemicals, prepare the necessary amount only.
- Do not spray solvents. Solvents will cause several parts to fail. Should solvents be sprayed, flush the sprayer with an abundance of water.

Cautions during operation

- During normal operation, take a break every two hours to maintain health.
- An operating battery-driven sprayer unit loaded with a solution of chemicals is a heavy object. Tidy up the farm field and avoid any unstable surfaces to prevent falls.
- Pay attention to clothes, field conditions, and the direction of wind to prevent exposure to agrochemicals and environmental solutions.
- During operation, do not allow any unauthorized person to approach the spraying site.
- Check the gasket of the chemical tank lid and tighten the lid securely so that it keeps the solution from spouting out.
- Never point the solution-spraying nozzle toward any person.
- Before taking a break or meal, gargle well and wash the hands and face with soap and water.
- If a person feels ill, allow him/her to receive a doctor's examination.

Precautions after use

- Thoroughly remove the remnant solution in the tank, put it in the original container, and stow away from the reach of infants. Also clearly remove the residual solution deposit on the machine surface. Otherwise the residue will cause rusting and failure.
- Clean the inside of chemical tank, spraying hose, and nozzle with clean water.
- If any area is damaged, repair it before storage. Only use the specified genuine parts and supplies available from us.
- Keep the storage place from humidity, dust and other foreign matter.

*When the unit is to be stored for a long period of time,
periodically discharge and recharge the battery to prevent performance degradation.*

2. Handling and operating method

Functions of the operating section

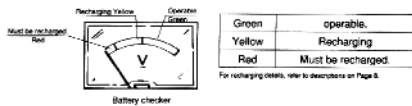
1. Grip
 - Gripping the grip lever turns the unit ON, opens the valve, and starts spraying.
 - Releasing the grip lever turns the unit OFF, closes the valve, and stops spraying.
 - Sliding the mode select lever allows you to select continuous spraying or spot spraying.
2. Shoulder Harness
 - Shoulder harness should be adjusted to fit securely, for highest comfort level.

Nozzle assembling

•First ensure that the gasket is put in place, screw the lance into the grip, and tandem nozzle head into the lance. In that step, check the gasket in place to prevent water leakage, and then tighten the screw securely. Be sure to tighten it while refraining from excessive tightening, which will cause the gasket to stick out.

Checking the battery charge

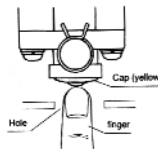
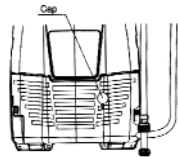
- Pour approximately 1 liter of water in the chemical tank.
- Turn switch ON, wait until pump sucks water to raise pressure, then check the graduation of the battery balance meter.



CAUTION

- Be sure to pour water in the chemical tank before inspection. Otherwise, the pump runs without load and causes a failure.
- Make it a rule to recharge the battery if the pointer approaches the yellow zone, even if it is still in the green zone.

Note - measures are required when the pump fails to suck water after a long time of storage:



Insert a finger into the hole and depress the yellow cap for one or two seconds

Dispensing chemicals

•Carefully read in advance the instruction sheet of the chemicals to be used, and follow the specified dispensing method and precautions for using it.

CAUTION

- When using a liquid chemical, first dispense at its specified proportion in a bucket or other container and allow it to dissolve completely before loading the sprayer.
- When pouring the solution in the tank, be sure to use the strainer provided.

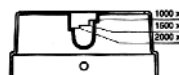
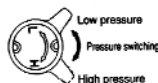
Starting

1. Choose the spray mode "spot spraying" or "continuous spraying"
2. Grip the lever and start spraying.

Stopping

1. Refer to the description on the functions of operating section
2. Pushing the release button releases the grip lever, and stops the spraying.
3. When the mode select lever is set at spot spraying position, releasing the grip lever stops the spraying.

Switching the Pressure-Regulating Valve
note: at shipping, the valve is set to low pressure



Use gauge for 10 liters
use gauge for 15 liters

Method for Using the Measuring Cup
use the convenient measuring cup (rough indicator) attached to the back of the strainer. To keep the solution from contamination, be sure to dissolve chemical in another container and filter the solution with strainer before pouring into the chemical tank.

3. Cleaning, Recharging, and Storage

Cleaning the inside of chemical tank

- After recovering the remnant solution, clean the inside of chemical tank by using clean water.



CAUTION

- Before cleaning, inspecting, and recharging, be sure to stop the BP-4.

Cleaning the pump inside with water

- After cleaning the inside of the chemical tank pour clean water into the tank again, run the pump, and clean the pump and nozzle interiors until the sprayed mist of chemical solution is completely replaced with clean water.

Caution

- Leaving the pump interior without water-cleaning will cause failure of the pump and nozzles
- Clean the strainer
- Always drain water after cleaning unit

Caution

- Do not fail to drain the tank- otherwise the freezing of water may damage the pump in winter.
- After draining the chemical tank, grip the grip lever to run the pump without load until the remaining water in the tank is completely discharged. Never continue the no-load run of the pump for longer than 1 minute- or pump may be damaged.

Recharging the battery

- Check the plug of the charger for damage, then insert it into the sprayer.
- Insert input plug to AC voltage.

Battery	12V 5.0AH
Charging Time	approx. 12 hrs.

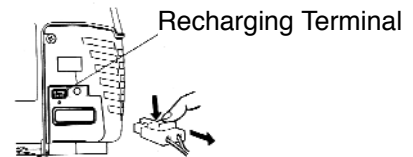
- After full charge, pull out input plug from the AC voltage.
- Pull out plug of charger from the sprayer.

DANGER

Use the genuine charger and battery. Otherwise, the battery may rupture.

CAUTION

- Charge indoors in a cool area.
- Do not put anything on the charger.
- Do not let plug and electrical line short.
- Avoid water to the plug, electrical line, and charger.
- Do not run sprayer while charging.
- Do not remodel anything.
- Do not shake the charger during operation.
- Pull out AC input plug only when the charging operation is finished.



How to exchange the battery assembly

Should your battery need servicing, please take it to a dealer or distributor. Do not service it yourself.

Parts List

Part Location	Part Name	Part #	Part Location	Part Name	Part #
Bracket (rear)	Battery	127122	Grip	O-Ring	124612
Bracket (rear)	Fuse	115385	Grip	O-Ring	14194
Bracket (rear)	Harness	124329	Lance	Lance	127253
Bracket (front)	Cap	126247	Tandem Nozzle Head		117958
Bracket (side)	Cap	126750	Variable Nozzle Head		127460
Bracket (side)	Battery tester	124328	Chemical Tank	Chemical Tank Lid	125876
Pump Seal Set	Seal set	641930	Chemical Tank	Strainer	123217
Pump	Seal packing retainer	123256	Back Carrying Band		126308
Pump	Cap(yellow)	116128	Back pad		123227
Pump A-Block	Piston packing	121434	Recharging Unit		12799
Pump B-Block	B Block Assembly	599680			
Pressure regulating valve	O-Ring	14180			

The Battery

DANGER

- Be sure to observe the following. Otherwise electrolyte leakage, heat generation, or rupture may occur.
- Do not disassemble or remodel the battery.
- Do not use spidering to the battery. (What did they mean by this?)
- Do not use any unauthorized recharging unit.
- Do not put the battery in fire or heat it up.
- Do not connect the terminals with a metal object (short out the battery).
- Do not connect any units other than the specified one to the battery.
- Ensure that the terminals are correctly connected with the corresponding terminals of the units.
- Do not directly connect the battery with the receptacle of a power supply or cigarette lighter of a vehicle.
- If the battery electrolyte gets in your eye, rinse it with clean water without rubbing it and immediately receive a doctor's examination. Otherwise you may lose eyesight.

WARNING

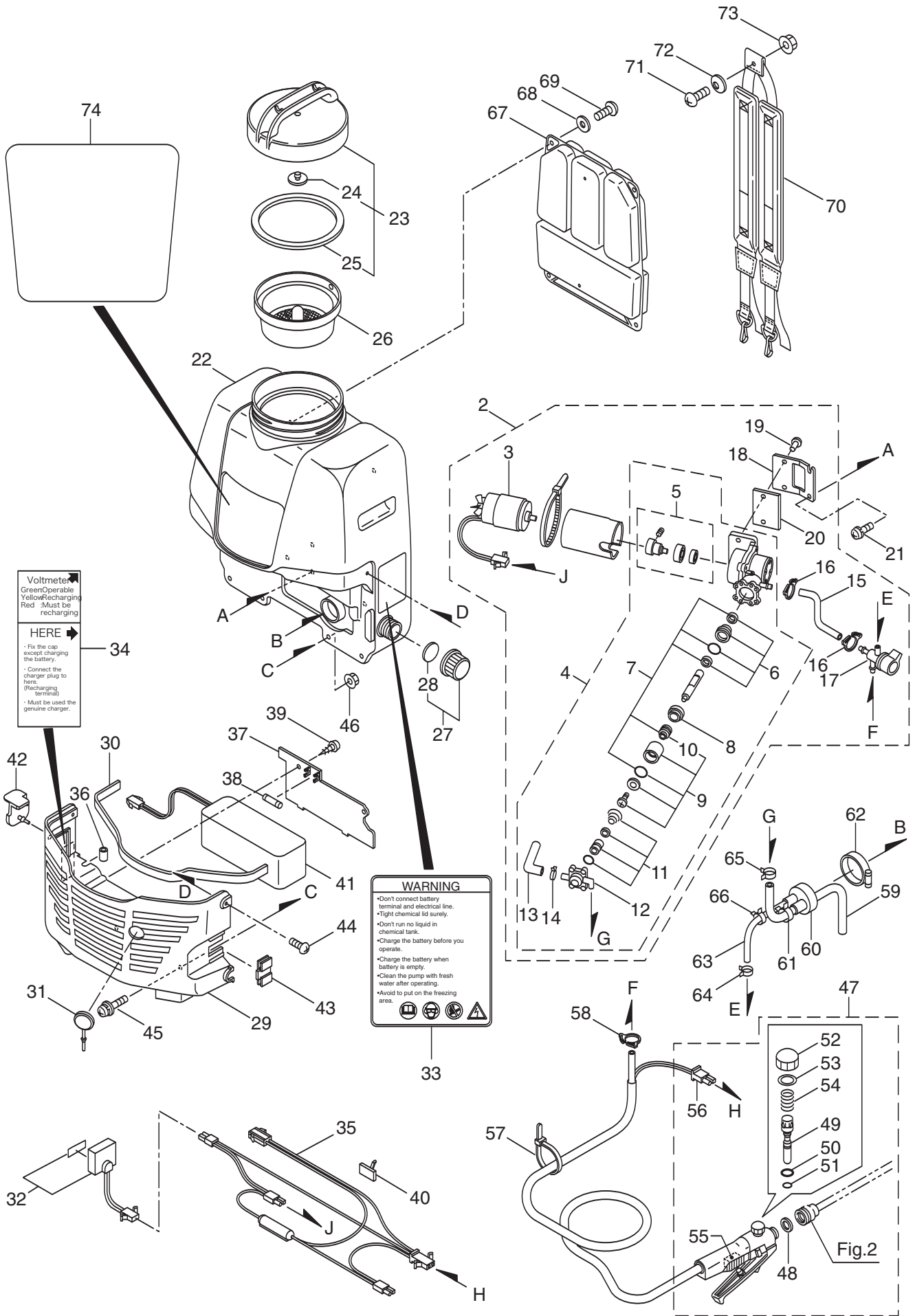
- Do not allow the battery to be immersed in or wet with water. Otherwise it may become heated or rusted.
- Do not scratch outer surface of battery or remove tube- or electrolyte leakage, heat generation, or rupture may occur.
- If the battery electrolyte is deposited on human skin or clothes, rinse area with clean water immediately- or skin disorders may result.

CAUTION

- Do not give a strong shock to the battery or throw an object at it. Otherwise electrolyte leakage, heat generation, or rupture may occur.
- Do not use or leave battery in an environment at a high temperature. Otherwise electrolyte leakage, heat generation, or rupture may occur.
- Store the battery in a place beyond the reach of babies and infants.

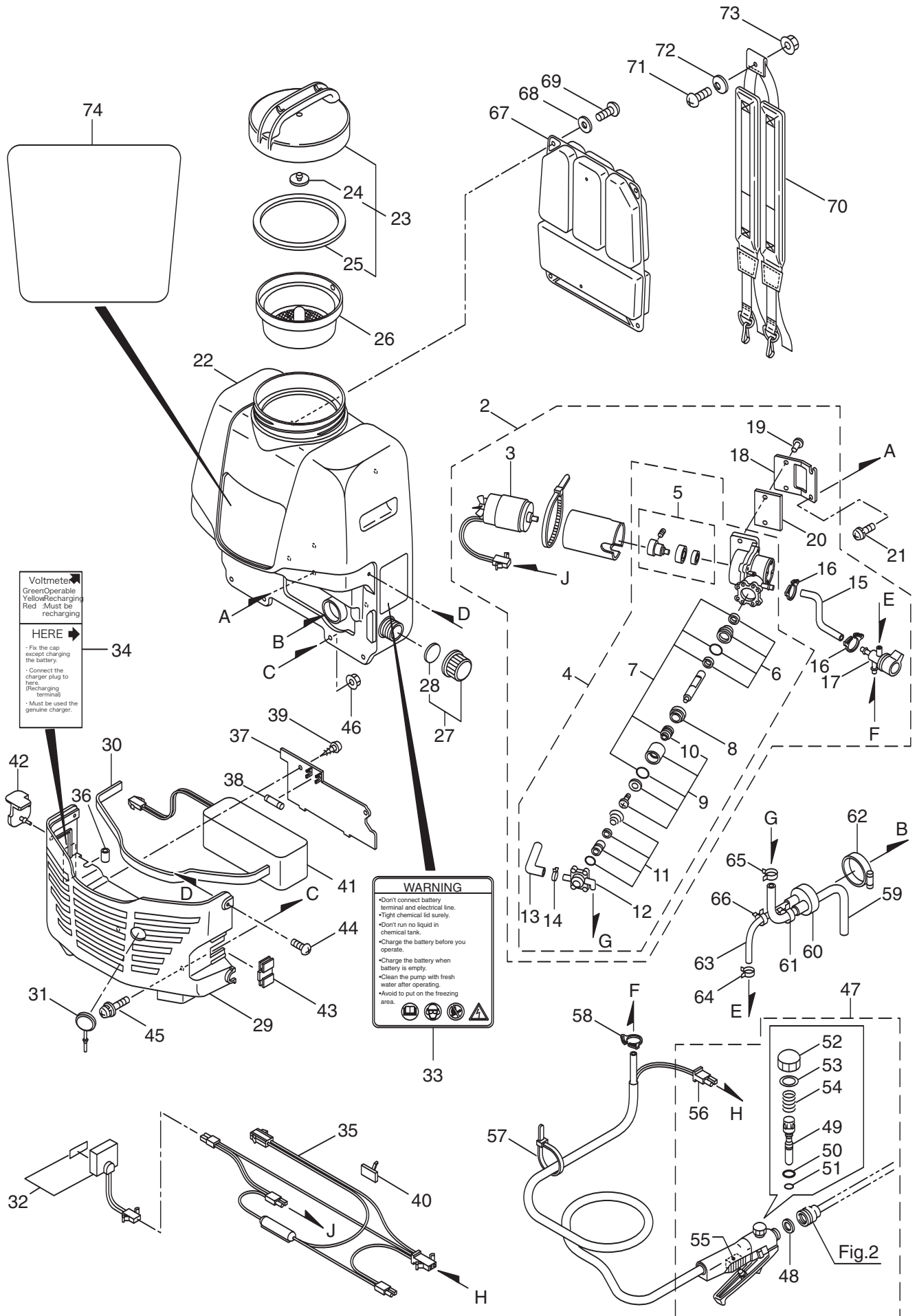
CAUTION

- When not using the battery, store it in a discharged state, and recharge it immediately before using it next time.
- Note: when battery is only slightly discharged, repeated recharging may decrease the service duration to an extremely short period of time.
- During long term storage, exercise recharging/discharging operation. Otherwise the battery performance will be degraded.
- Do not store the battery in such a place where it is subjected to direct sunlight or in a high temperature and high humidity environment. Otherwise the battery service life will be shortened.



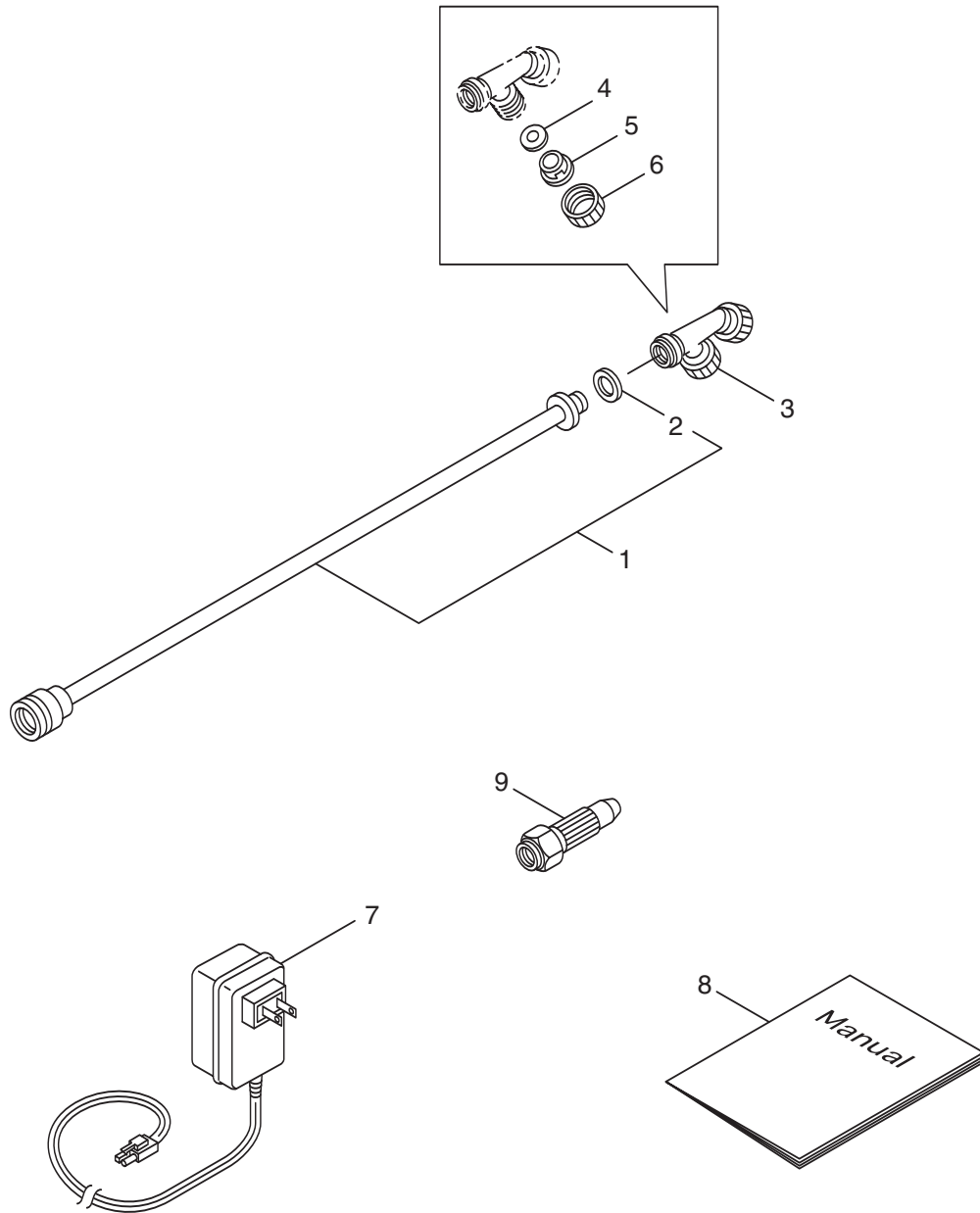
Ref. No.	Part No.	Part Name	Q'ty	Remarks
1-2	127125	Pump Ass'y	1	Incl.2-20
1-3	411201	Motor	1	
1-4	403168	Pump	1	Incl.5-14
1-5	641928	Camshaft Ass'y	1	
1-6	409681	Seal Set	1	
1-7	599682	Packing Set	1	
1-8	123256	Seal Retainer	1	
1-9	641931	A Block Ass'y	1	Incl.10
1-10	121434	Piston Packing	1	
1-11	599680	B Block Ass'y	1	
1-12	116287	Manifold Ass'y	1	
1-13	125901	Cap	1	
1-14	043832	Band	1	
1-15	125873	Hose	1	
1-16	127631	Hose Clamp	2	
1-17	123290	Pressure Regulator Valve Ass'y	1	
1-18	125889	Plate	1	
1-19	123461	Fastener	2	
1-20	116304	Buffer	1	
1-21	126760	Screw	2	M6X10
1-22	126240	Chemical Tank	1	
1-23	125876	Cap, Chemical Tank	1	Incl.24,25
1-24	126668	Valve	1	
1-25	123216	Packing	1	
1-26	123217	Strainer	1	
1-27	123417	Cap Ass'y	1	Incl.28
1-28	123418	Packing	1	
1-29	127386	Bracket	1	
1-30	125884	Packing	1	
1-31	126247	Cap	1	
1-32	124384	Battery Checker Ass'y	1	
1-33	127870	Label	1	
1-34	127467	Label	1	
1-35	124329	Wire Harness	1	
1-36	127391	Tube	1	
1-37	125887	Cover	1	
1-38	115385	Fuse	1	
1-39	127388	Screw	2	5X12
1-40	146127	Clamp	1	
1-41	127122	Battery	1	
1-42	126750	Cap	1	
1-43	127397	Plug	1	
1-44	127389	Screw	2	M6X10
1-45	127390	Screw	2	M6X25

1. BP-4 MAIN BODY



Ref. No.	Part No.	Part Name	Q'ty	Remarks
1-46	126756	Nut	2	M6
1-47	642038	Hand Nozzle Ass'y	1	Incl.48-56
1-48	115865	Packing	1	
1-49	117547	Valve	1	
1-50	124612	O-Ring	1	
1-51	014194	O-Ring	1	
1-52	117070	Cap	1	
1-53	116670	Packing	1	
1-54	117074	Spring	1	
1-55	117549	Switch	1	
1-56	116013	Connector	1	
1-57	107046	Band	1	
1-58	127631	Hose Clamp	1	
1-59	125902	Hose	1	
1-60	125903	Hose Boots	1	
1-61	103033	Band	1	
1-62	124813	Band	1	
1-63	124385	Hose	1	
1-64	112530	Band	1	
1-65	043832	Band	1	
1-66	127241	Band	1	
1-67	123227	Cushion Pad	1	
1-68	106352	Packing	4	
1-69	126758	Screw	4	M6X8
1-70	126308	Knapsack Band	1	
1-71	127221	Screw	1	M6X16
1-72	127224	Washer	1	
1-73	127237	Nut	1	M6
1-74	127977	Label	1	

2. BP-4
ACCESSORIES



Ref. No.	Part No.	Part Name	Q'ty	Remarks
2-1	127253	Nozzle Pipe Ass'y	1	Incl.2
2-2	112850	Packing	1	
2-3	117958	Wide Nozzle Ass'y	1	Incl.4-6
2-4	103171	Packing	2	
2-5	118266	Nozzle Plate	2	
2-6	103173	Cap	2	
2-7	127999	Battery Charger	1	
2-8	127979	Instruction Manual	1	
2-9	127460	Nozzle Ass'y	1	

4. Trouble shooting and remedies

For items marked with an asterisk (*), contact distributor that delivered battery to you or our sales office for adjustment or repair.

SPRAY FAILURE

Problem	Cause	Remedy
The motor fails to run	connector disengagement.....connect properly switch malfunctionreplace it * open circuit of wiring.....replace or repair it * fuse blown-out.....replace it motor disconnectionreplace it * motor winding burnout.....replace it * battery voltage drop.....recharge or replace it piston seal stickingreplace it *	
spray is stopped although the motor runs,	nozzle clogging.....clean it water suction valve stickingmanipulate cap (yellow) or clean it * pump valve cloggingclean it	
pressure fails to rise	pump valve cloggingclean it * pressure-regulating valve clogging.....clean it * pressure-regulating valve abrasionreplace it * nozzle tip abrasionreplace it * water suction hose clogging or collapsingclean or repair it * Battery voltage dropreplace it	

RECHARGE FAILURE

Problem	Cause	Remedy
the battery cannot be recharged	battery abnormalityreplace it * recharging unit abnormalityreplace it * connector connection failure.....connect properly open circuit of wiring.....replace or repair it *	
the battery capacity recovered	recharging time shortagereplace it * battery abnormalityreplace it * recharging unit abnormalityreplace it *	

FUSE BLOW-OUT

Problem	Cause	Remedy
pump fails to run	piston seal stickingreplace it * switch contact failure.....replace the switch * turning the switch ON during recharging.....operate properly motor rotation is slowreplace the motor *	